

In This Issue—Two Association Stories

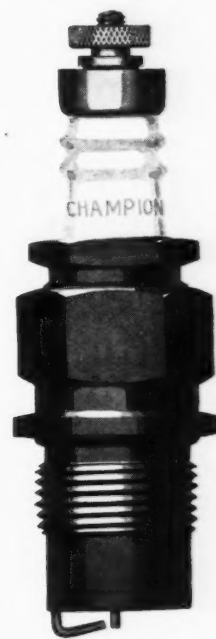
MOTOR AGE

Vol. XLIII
Number 17

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CHICAGO, APRIL 26, 1923

Thirty-five Cents a Copy
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Champion Advertising Helps Every Champion Dealer



CHAMPION

X



Champion X is the recognized standard spark plug for Ford Cars and Trucks and Fordson Tractors. Recognized by dealers and owners for 10 years as the most economical and efficient spark plug. Sold by dealers everywhere.

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CHAMPION

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chandise helps we place at the disposal of
Sunbeam dealers.

Plan now to get your share of Sunbeam sales
and profits this season. We shall be glad to
supply you, through your jobber.

Manufactured
by

THOMA & SON-INC.
Everything in
Glass for the Automobile

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Do you depend upon your memory? Do you wait until some part breaks for want of lubrication? Do you waste time looking for places where you think oil and grease may be needed?

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A lubrication chart furnished with every Stewart Speedometer tells you where oil and grease are needed whenever one of the five colors appears.

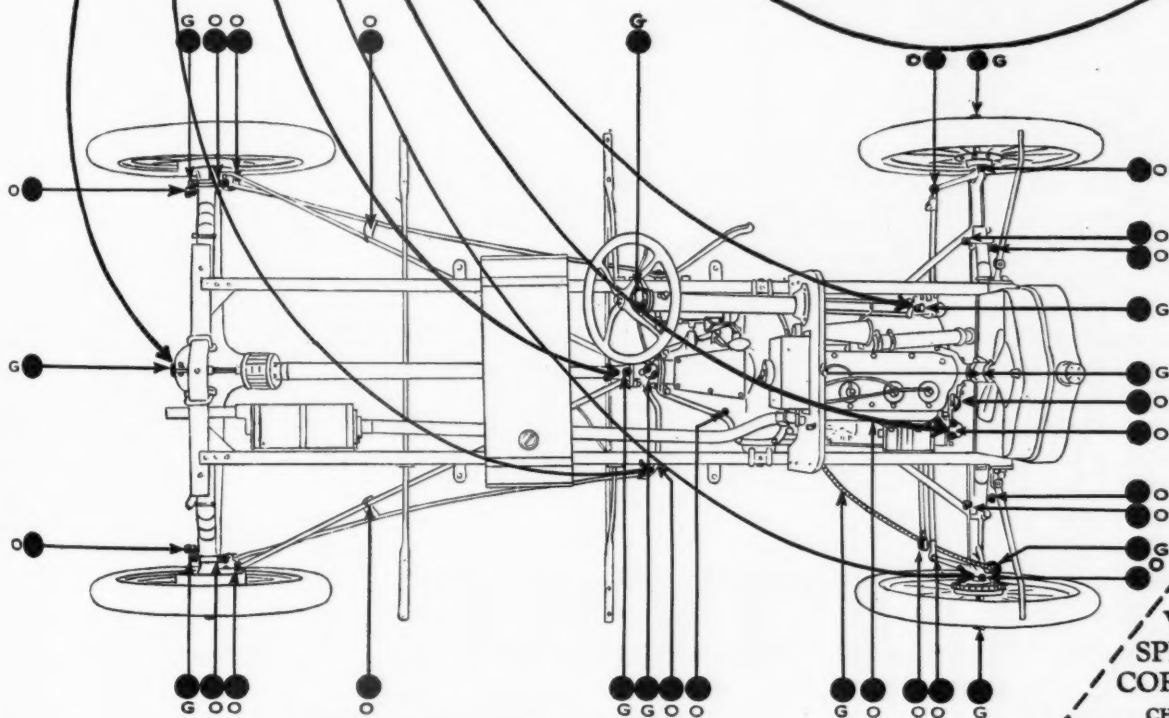
Just tear out and mail the coupon for free copy of this lubrication chart.

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\$15.00

(Western Price
\$15.50)



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USED ON 8 MILLION CARS

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CORPORATION,
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Send free copy of lubrication chart that shows how colored dials will assist me.

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Town.....

State.....

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Almost every week another advantage of the Burroughs Simplified Accounting Plan for Garages and Dealers comes to light.

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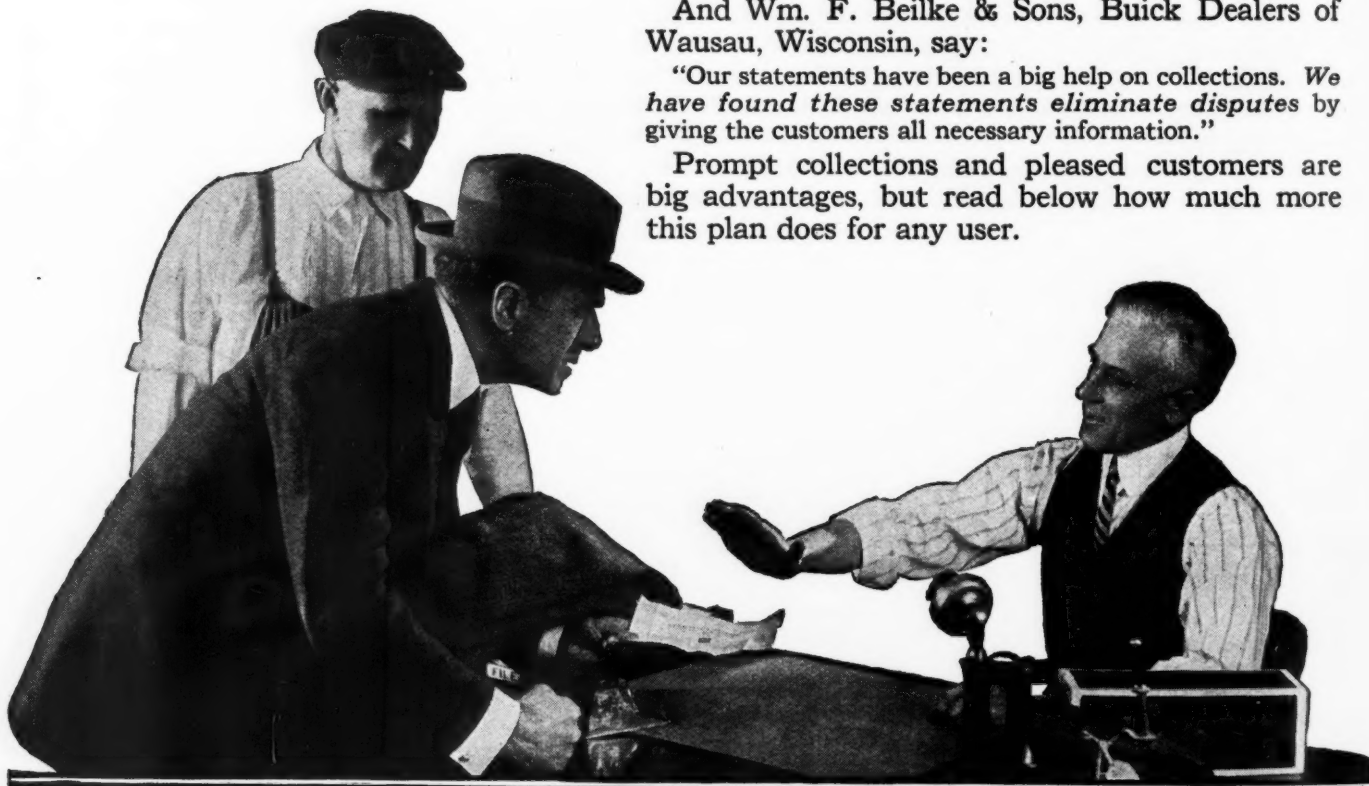
"We have used the Burroughs Simplified Accounting Plan for two years and have already saved the price of the system in time and expense, not to mention the satisfaction of being able to hand a nice neatly printed statement to our customers at any time."

"There are no more arguments about last month's purchases or unpaid balances."

And Wm. F. Beilke & Sons, Buick Dealers of Wausau, Wisconsin, say:

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Burroughs Adding Machine Co.,
6014 Second Blvd., Detroit, Mich.

Please send complete information about the Burroughs Simplified Accounting Plan for Garages.

☐ Garage ☐ Car Dealer ☐ Accessories Store

Name.....

Address.....

MOTOR AGE

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Never was the Goodrich Line more complete. A tire for every prospect.

Every tire is Goodrich quality through and through. When you sell a Goodrich tire you sell a satisfaction that brings you good will and future profits.

Why waste your energy and tie-up capital with a number of incomplete lines—when you can concentrate on the line that has a tire for every purse and purpose.

You can bank on Goodrich tires. You can bank on Goodrich square deal merchandising policy. You can bank on Goodrich co-operation today—next year and next generation.

If you are building your business for permanent profits let your foundation be Goodrich quality. It never shifts.

The
B.F. GOODRICH RUBBER CO.
 Akron, Ohio

Goodrich TIRES

"BEST IN THE LONG RUN"





Why Jobbers' Salesmen Recommend "Milwaukee"

Turn-overs—that's the answer!

Thousands of live accessory merchants trace a good share of their profits to a fast-turning stock of Milwaukee Timers.

Daily sales—no "explaining" to do—not much money tied up! No wonder the tendency in the trade is to "standardize on Milwaukee".

Your customers see Milwaukee Timers advertised in the magazines they read (The Saturday Evening Post, American Magazine, and the leading farm and motoring papers). This advertising is working all the time to help your sales.

Re-order Milwaukee Timers when your jobber's salesman calls—or by mail today.

Milwaukee Timers are now shipped in an attractive 4-color Display Box — 10 timers to a box. Put this "silent salesman" on your counter. It should empty itself in a week.



Milwaukee Motor Products, Inc.
Milwaukee, Wisconsin

(TIMER BUILDERS FOR OVER 18 YEARS)

MILWAUKEE TIMER for FORDS

SELLS FAST at \$2.00
[In Canada \$2.75]

More Proof of the Pudding

Studebaker's sales of repair parts, covering repairs due to accidents as well as replacements, averaged but \$13 per car in operation in 1922.

While the sale of Studebaker cars has mounted strikingly, our parts sales show a gradual decrease.

This emphasizes two very important facts: that Studebaker cars are delivering a high degree of satisfaction to owners; and that the Studebaker dealer is primarily in business to sell cars—not parts.

This also means that the Studebaker dealer does not have to carry burdensome stocks of slow-moving repair parts. And to supplement the dealer's stocks, when necessary, every Studebaker dealer in the United States is within over-night touch with one of the Studebaker Parts Depots, established at strategic points throughout the country.

The low maintenance cost, and the consequent small depreciation of Studebaker cars in the second-hand market are advantages that enable Studebaker dealers everywhere to make permanent customers and to build up a profitable business.

MODELS AND PRICES— <i>f. o. b. factories</i>		
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Touring.....\$975	Touring.....\$1275	Touring.....\$1750
Roadster (3-Pass.).....975	Roadster (2-Pass.).....1250	Speedster (5-Pass.).....1835
Coupe-Roadster (2-Pass.).....1225	Coupe (4-Pass.).....1875	Coupe (4-Pass.).....2400
Sedan.....1550	Sedan.....2050	Coupe (5-Pass.).....2550
		Sedan.....2750

THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana



T H I S I S A S T U D E B A K E R Y E A R



317 Nash Cars in Neenah-Menasha, Wis. (Population, 14,385)

51 Nash cars have been sold since September 1st, in Neenah-Menasha, Wisconsin—population 14,385. Since the Tri-City Nash Company took on the Nash line they have placed in Neenah-Menasha and immediate vicinity 317 Nash automobiles.

Nash dealers in scores of cities of similar size throughout the country have had similar experience with the Nash franchise. These men tell us there are other automobile dealers in their respective cities who have been in business just as long, and who are just as good business men, but who are selling less than one-half as many cars.

If you had the Nash line in your territory, you could duplicate this success.

Now is the time to secure the Nash contract.

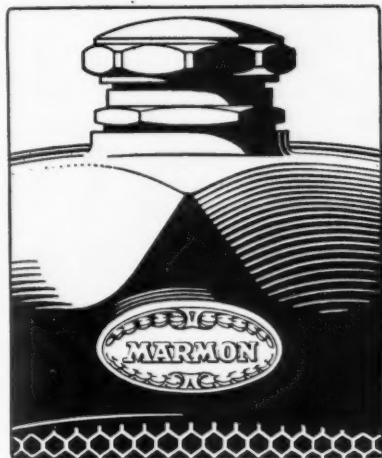
NASH

THE NASH MOTORS COMPANY
KENOSHA, WISCONSIN

Nash Leads the World in Motor Car Value

(1521)





MARMON

*Marmon sales records for
the first quarter show one
of the most substantial
gains in Marmon history.*

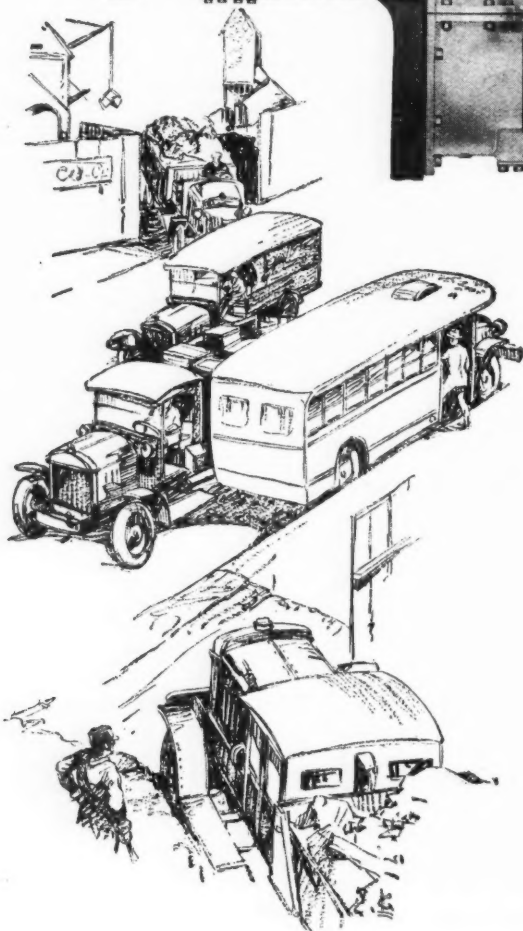
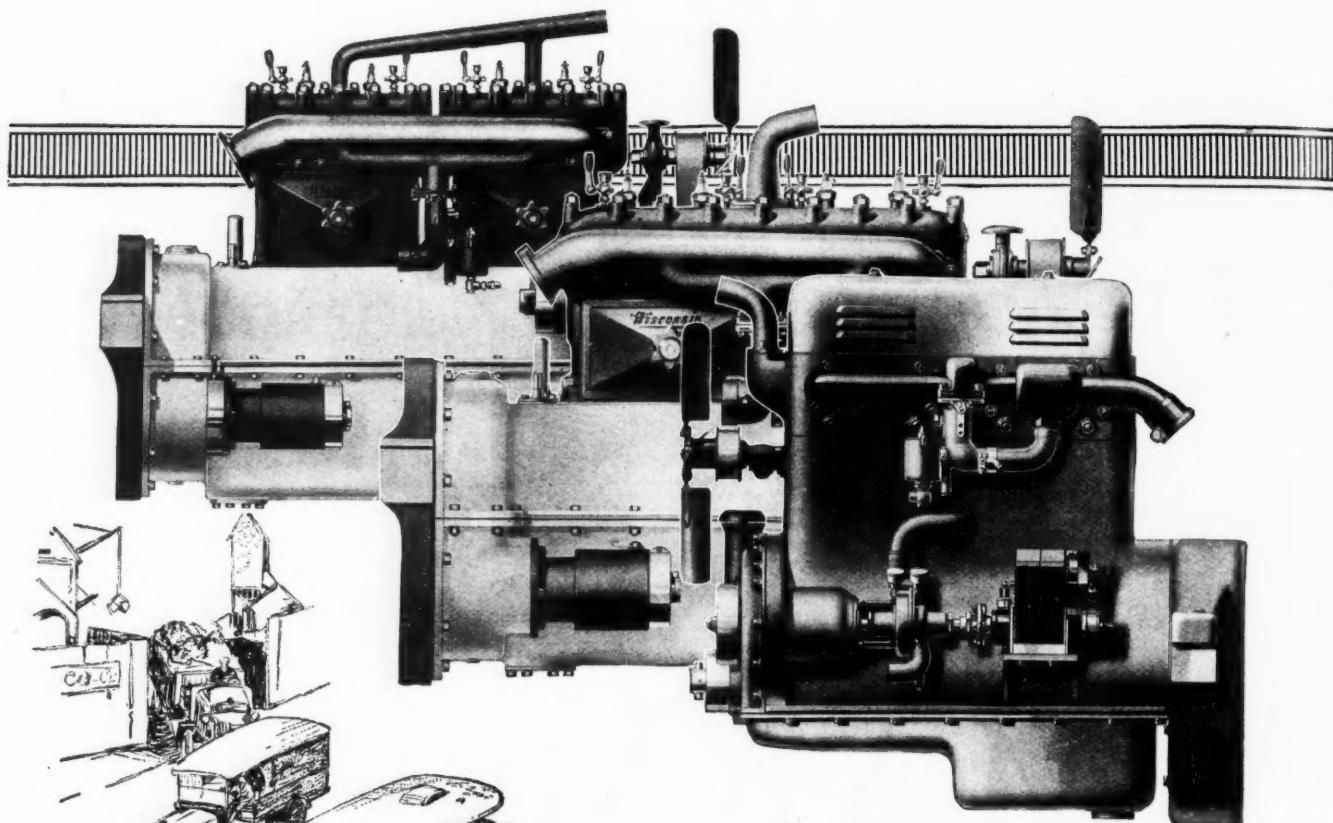
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NORDYKE & MARMON COMPANY

Established 1851 • INDIANAPOLIS

Address Inquiries to Dept. A





Offices in New York,
Cleveland, Chicago, Los
Angeles, Seattle.

In Trucks That Keep Going

—You'll find Wisconsin Motors.

They are sturdy, enduring, honest in performance and construction. That's why.

Wisconsin motors are built by experienced engineers—no freak designs that your mechanics have to figure out. They are accessible—simple—fitted to the work they are to perform.

Nothing is skimmed in the material and workmanship that goes into them.

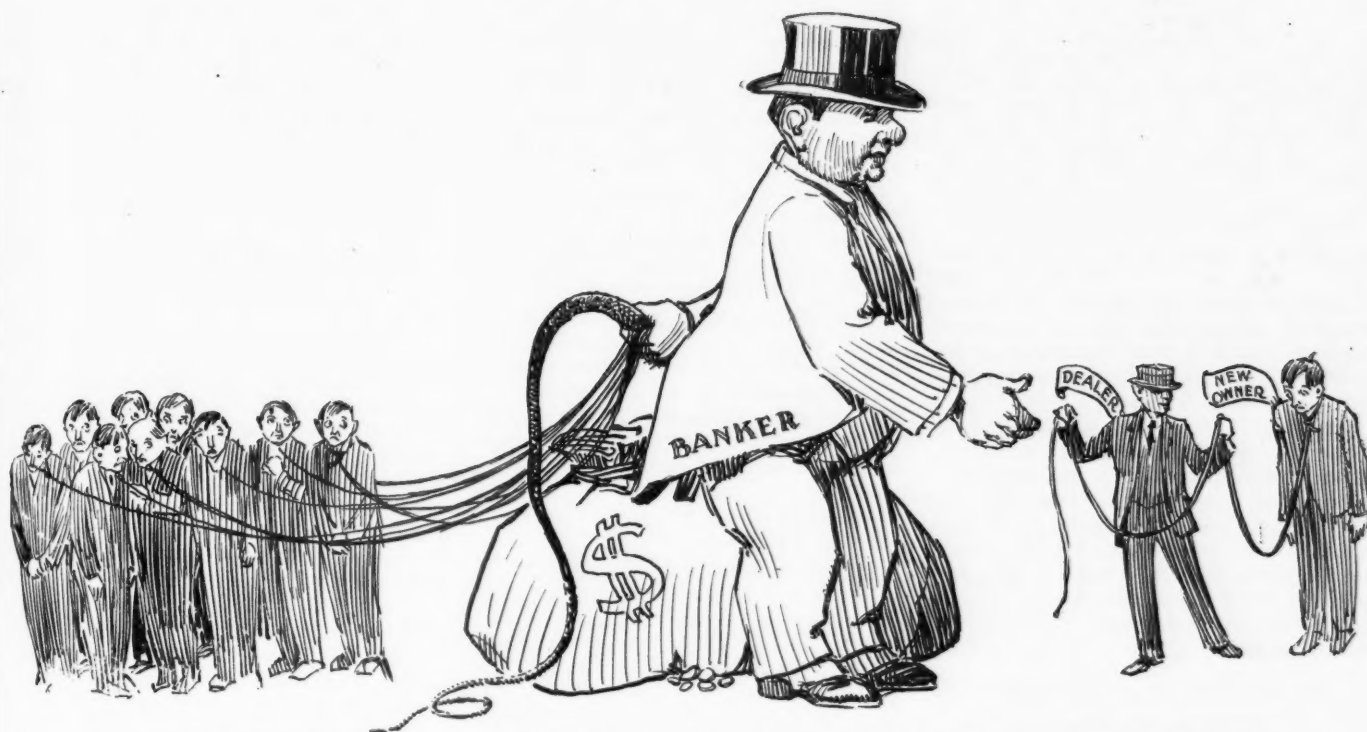
And yet they cost no more."

Wisconsin performance figures will sell trucks for you. Are they under the hood of the line you handle?

WISCONSIN MOTOR MFG. CO.
MILWAUKEE WISCONSIN

Wisconsin
CONSISTENT

MOTOR AGE



It must be a shock to the customer to find that the dealer's establishment is merely a salesroom for a banking concern

Keeping in Touch with the Car Owner Will Check Dealer Mortality

A Time Payment Banker's Discussion of Responsibility—Some Examples of Good and Bad Merchandising

By CLYDE JENNINGS

A VETERAN banker was talking on banking practices within the automotive dealer industry, especially the question of time sales and borrowing on storage and floor cars. He said this:

"When I hear a dealer say that he wants to sell his time payment paper under the non-recourse plan I am off of that man. I cannot conceive of an earnest merchant who wants to cut loose all strings on his customer.

"I have been an intimate observer of time payment

sales for a long time. I was interested in this banking development before automobiles were sold on time payment plans. I have been watching the development of this business and the development of the merchants who use it.

"Think what a shock it must be to a customer to realize that he has bought an article of many years' use from a dealer and then been notified that he must make his payments some place else; that he really did not buy this car of that dealer at all. That the dealer's estab-

ment was not a store but merely a sales-room for a banking concern. It must be a shock to the customer.

"Then, as I understand it, the market created by the sale of the car is a prospective market with a greater profit than the mere sale of the car. This includes the sale of equipment for that car, such as tires, bumpers and other things that the car owner may need or want, the maintenance and the parts. It is this market that must make money for the dealer.

"I do not look upon the sale of cars today as an especially attractive business if the business is to be confined to the mere sale of automobiles at present discounts. The profit is so small that it requires a quick turnover and when conditions are such that a quick turnover is not possible, there is nothing to keep the expensive establishment functioning, except that money which has been counted as profits."

These remarks were made in the course of a conversation on dealer mortality. This banker said that he had studied the mortality question for a considerable period and that his constant surprise was that new men coming into the business did not profit by the experiences of those who had gone before.

This man has close business relations with the sales management of half a dozen or more automobile and truck factories. He has continued his intimate and friendly relations with these factories over a long period. He does business with as many more automobile manufacturing organizations. He is practically dealer credit manager for some factories.

JUST WHAT DOES THE "AFTER MARKET" MEAN?

The above is rather a cold-blooded statement of fault on the part of some dealers. Now what does this "after market" for an automobile mean. Is it as important as this banker appears to think? Here is a case in point:

There is, in an Indiana city of 50,000, a dealer in one of the popular makes of the medium priced cars. He sells but one make of car but he has three chassis models and his price range is from practically \$1000 to \$4000. A little less or more on each end does not matter.

Last year this man did a business of practically \$1,000,000 gross. His car sales were somewhat less than half of the total, say half and it will serve very well. His accessory sales amount to \$100,000 gross. Besides accessories and cars he has these departments: Storage garage, used cars, paint, trim, battery, shop and service.

The gross profit on his cars was 20 per cent, or \$100,000.

The gross profit on his accessories and tires was 33 per cent, or \$33,000.

The gross on his labor in the other departments was about 50 per cent, making his gross on all except the car sales a little more than \$200,000.

Certain arbitrary rules of accounting govern the announced profits on each of these departments, so these figures

are not of particular interest here. The point made is merely to show that this man, who considers himself a transportation merchant, is earning a much greater gross and net profit from other items than car sales, than he is from car sales. This dealer says without hesitation that if his factory should intimate to him that he could not sell accessories, or that he should drop any of his lines of activity, that he would cut away from that factory and sell another line of cars.

Just as an added line, we might say that this man is not interested in the used car problem. He says he has never had one, because he has always bought his used cars for the proper price. The only mistakes made have been in the estimate of the car and he never expects to do business without mistakes. Besides the low bids he gives on good cars about equalize the high bids on poor cars. He never considers competition on bidding on used cars. When he buys a used car, he does what is necessary to make this car worthy of a certificate of quality from his store.

This dealer's territory has about 700 of the make of car he sells in it. He has about 80 per cent of these owners on his books. Some of them are only occasional customers, but most of them spend all of their automobile money with him. All of this man's time payment paper is indorsed by him and all collections made in his place. He has never repossessed a car.

On the other side of the picture there is in Chicago a dealer in a similar car in number of chassis models and price range, who is going broke because he can see profit only in car sales. This dealer took over a run-down business a year or so ago and he has accelerated the speed of the running down, if anything. It has been estimated that there are 2000 cars of his make in his territory and this dealer has never canvassed these owners to learn if they are getting satisfactory service, he has no accessories or tires in stock, his high water mark in the shop has been five men and one man in his storage department.

During his career as a dealer he has had some 40 names on his salesmen's list and none of them have averaged \$15 a week in commissions. None of the original force is now with him. No constructive help has been given to any of these salesmen, except a subscription to a weekly letter from a psychologist who writes about selling goods to retail dealers. These letters have never mentioned the sale of an article similar to an automobile. There is no prospect list in the place except that gathered from callers at the store.

This dealer does not read an automotive business paper and neither his distributor nor manufacturer has ever suggested that he should. He has the queerest lot of junk reference advertising circulars one has ever seen. He belongs to no association and never holds a meeting of his own employees.

His name will soon be added to those dealers who fail.

Incidentally, all of his time sales are

financed by the non-recourse system and he is glad when he sees the last of the new car owner. It has never been suggested to the salesmen that they should follow up their buyers.

Recently a Chicago distributor for a rather expensive car signed as a new dealer a man who had been out of business for three years or so, enjoying a vacation. He got tired playing and decided to come back into business. The distributor was amazed when this man showed him a balance sheet of his last year in business. He was then handling a popular make of a popular priced car.

This balance sheet showed that in a suburban location, with many alley garages and a large number of stores selling accessories in competition, that this man made a greater net profit from his transportation store than the gross discounts on his car sales. And he was accounted one of the good dealers in his district, sales and population considered.

THE USED CAR POLICY THAT KILLS PROFITS

Here is a sample of how some men miss profits. It was related by a man who has had considerable automotive sales experience, who was an eye and ear witness to the entire deal.

A prospect entered a likely looking store and was met by a salesman who had talked with him previously. The salesman was a quick, sure worker and in fifteen minutes had a sale closed except the price on the used car. A call was sent to the used car department and the manager came with a pad of printed slips, looked the car over, drove it around the block, made his estimate and the deal was closed, a phaeton type car being purchased.

Then the salesman took his prospect to a sedan, asked the new owner to sit down in it, got in with him, produced two cigars and lighted them from the cigar lighter in the car and began a new line of attack. The prospect was a piano dealer and the salesman talked to him about the increased prestige of bringing his piano prospects to his store in a luxurious sedan. The talk won and the piano dealer decided to change his order from a phaeton to a sedan. Incidentally, he raised the question of an increased allowance on his used car.

And right here the fast moving dramatic presentation of high type salesmanship was changed into a farce.

The used car department was called again and the same man appeared with his pad of examination sheets and he again went over this car, with the result that he increased his valuation from \$350 to \$600. The sedan was sold.

Can a man with such methods survive? Should he?

THE RELATION OF FACTORY DISCOUNT TO PROFITS

Now to get back to the banker and his ideas.

The banker said that he was not much interested in the rate of discount, as he had found too many dealers who paid

so little attention to the discount allowed by the factory, but were dazzled by the amount of the discount as applied to a particular car. These dealers, he said, do not think in terms of per cent, but they think of \$200 as the profit on a \$1000 car.

"I know the factory attitude very well indeed," he said, "and I know that when the dealers of this country are in position to prove that the present discount rate is not sufficient that it will be changed."

Then he talked further about dealer mortality.

He had reviewed the official reports of many failures and he had not been convinced that in any one of them the mortality was due to a low factory discount. Always he could find some trace of foolishness that was not in keeping with good business. The ordinary run of bankers are not good advisors of automobile dealers, because they do not understand the quick movement of cash in this business, the proper method of placing time payment sales nor how to loan money on automobiles.

Regular bankers are too inclined to consider the standing of the manufacturer strictly as a business man and too likely to forget that it is an automobile that is the subject of the loan and it is only the question as to whether or not this vehicle will give satisfaction for less than a year that is involved. The other factor that counts is the merchant who sold it. Too many bankers regard the car sale as the thing, and next to that the financial reputation of the manufacturer.

In that they are wrong. The two points are the automobile and the dealer. If the automobile was built right, and the dealer is a good business man—a transportation merchant—the loan is safe, but the dealer must be kept connected with the car.

The real risk in the making of automobile loans enters when the dealer as-

sumes that his interest in the car ceases when the sale has been completed and the car delivered, for he then fails to secure the business which marks the difference between success and failure.

FACTORIES TAKE A NEW INTEREST IN DEALER PROSPERITY

It is no secret that some factories have become quite interested in the prosperity of the dealer and the question of appointing new dealers is undergoing a serious change. Recapitulation of last year's business has shown the following average sales per dealer for four popular medium priced cars:

- A—20 cars.
- B—30 cars.
- C—37 cars.
- D—40 cars.

The sales department of A car frankly admits that the dealers in this car cannot survive if depending chiefly on sales and a special effort has been in progress for a year to get these dealers more interested in the sale of maintenance at a profit. If each sale of these cars had been of the highest priced sedans this company makes, the gross income would have averaged less than \$10,000 per dealer. A special effort is being made to increase the average of sales per dealer.

If each of the D factory dealers had sold a phaeton to each customer, his gross would have been about \$10,000 a year. And it must be considered that some of the dealers in D cars pay more rent than that for salesrooms, so some of the dealers must have had a very small share in the revenue. This factory has recognized this limitation and is advising dealers to take on additional lines of cars to help them survive.

The C factory is not very friendly to more than one line of cars in a dealer's place. It is rather inclined to like exclusive sales representation. If the dealers in this organization had sold all

phaeton models of the lesser price the average gross revenue would have been something like \$7,500. If only the highest priced model made by the C factory had been sold, the gross discount would have been \$20,350 for each dealer.

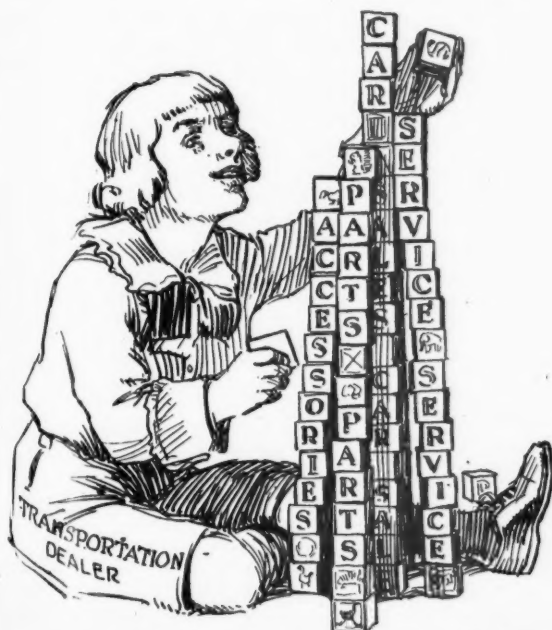
From the above figures it will be seen that dealers in groups of 1500 to 5000 cannot begin to survive on car sale discounts. Look over the places of business and get an estimate of rent, light, heat, clerical and sales help and other necessary expenses.

It can be said here that the factories in this list are going very slow on the appointment of more dealers. There is the beginning of the selective process and dealers who do not or cannot grasp the idea of several sources of profit are not going to be kept on the list. These factory officials realize that a continuation of dealer mortality eventually means factory mortality.

The factory attitude toward dealer prosperity is rapidly changing and at the same time there is coming a great change in the factory attitude toward dealer associations and other lines of work that are going forward to make better dealers. The attitude toward a dealer selling two lines of cars is almost an about face.

But most of all, the factory is getting interested in a profitable shop, in the sale of accessories and tires, in the proper handling of used cars, in such dealer departments as batteries, electrical work and in the proper pricing of parts. When the factory realizes what an important part it has had in driving the car owner away from the dealer by the over pricing of replacement parts, a great good will have been accomplished.

The more you study this question, the more you are convinced that the answer to the dealer mortality question is the TRANSPORTATION STORE instead of the salesroom and the exercise of common sense by the factories toward dealers and dealer associations.



Dealers cannot succeed on car sales alone

Dealers: { Why Not Turn Last Year's \$100,000,000 Loss Into Profit?

This Is the Time and Place. New Merchandise Is Scarce, But Bidding on the Other Man's Junk Is Running Riot, Vane Finds

By C. A. VANE

General Manager National Automobile Dealers' Association

DEALER prosperity? Is it the same thing as manufacturer's prosperity? Is it real or apparent?

These questions have been universally flung at me on my recent four months' trip throughout the eastern and southern states, a trip in which I have covered some 15,000 miles and talked to nearly 10,000 people in the trade and with bankers and finance corporation agents.

The manufacturing schedule calls for a production of between 2,700,000 and 3,000,000 cars, and as the manufacturer is paid for his merchandise in cash the control of his profits is relatively a simple matter in his own hands compared to the profits of the dealer for the very factor, **VOLUME**, that is the surest guarantee of the manufacturer's profits, may be the element that contributes most to the dealer's disaster.

This is not said in criticism of the manufacturing program. It is an observation based upon a knowledge of the inefficiency that prevails in the average automobile merchandising establishment and the woeful lack of knowledge and the fundamentals of business that runs through the smaller dealer establishments of the country, the establishments which furnish the outlet for probably 75 per cent of the product.

I am convinced after five years of contact with the dealer situation nationally (the last eighteen months having been one of extensive and intensive study) that probably three-fourths of the dealers' causes of complaint, usually taking form in denunciation of the manufacturer, can be traced primarily to the dealer establishments themselves.

The most glaring example of this fact at present is the dealer tendency to again open up on allowances on used cars. A serious problem during the winter, one that brought consternation to many a dealer, he is now forgetting the lesson that was painfully brought home during the last six months, and in the general new car buying wave which has swept the country, he is moving back again into the practices that put grief in his cash drawer instead of dividends.

If ever there was a time when the dealers had it in their power to begin beating used car prices down, it is now. Two highly important major items are at work on their side and yet thousands of them are disregarding this aid and continuing the practices of years which

every winter show alarming losses. These factors are:

1. The shortage of motor cars.
2. The movement from open to enclosed cars.

With a shortage of production, even in face of the enormous deliveries by the manufacturers, dealers are still over-allowing. And, instead of holding up the price of the new merchandise which the public is eagerly seeking, dealers are permitting the buyer to force up the price on the used car in disposing of their new closed jobs which they are even short of, and which in many instances could be sold probably for cash, so amazingly has the buying tendency swung to enclosed vehicles.

Now here is a condition which is the direct contrast to the one so often complained of in dealer circles, that long allowances are made as the result of forceful feeding by the manufacturer. Here ostensibly is a situation in which there isn't enough cars to go around (at least during this spring buying wave), and still the dealers are disregarding fundamentals of good business. By taking these decreased profits at this time the dealer, of course, is in a better financial position than he was last winter, but it is time to realize that this is a twelve-months business and that overhead and sales expense go on just the same when merchandise is moving slowly as it does when merchandise is flying in and out of the salesroom.

We have gone a long way this last winter in our realization of the penalty attaching to mismanaged used car departments, and it is deplorable to see the tendency again overcoming the good work that has been accomplished. The publicity given to the efforts of the Boston Used Car Statistical Bureau, coupled with the admirable field work of L. B. Sanders, secretary of the bureau, has re-invigorated a score of association activities on the used cars.

The manual of Used Car Co-operation is published by the National Association of Show Managers was also an excellent piece of information for the guidance of dealers who wanted honestly to meet the problem on home grounds. The survey undertaken and continuing by the National Automobile Dealers' Association has brought home as never before to the dealers, just to what extent their profits have been paralyzed by unbusinesslike

handling of used automobiles. Of course there are dealers, many of them, who have learned the lesson and who are going to conduct their used car dealings in a business-like way, regardless of what any other dealer does, but still the position of this dealer is not made very comfortable by the practices of competitors and even dealers in non-competing cars who have not yet awakened to their own responsibility in the situation.

I am forced to the conclusion that a list price on a new automobile means nothing any more, because this list price is made the target at which used car allowances are shot up and down. Yet it was the list price principle which made the automobile industry what it is today and every effort of dealers and manufacturers should be bent to see that this list price is uniformly adhered to.

The dealer who would be horror stricken at the thought of cutting a list price \$200 or \$300 to a cash customer, has no scruples at adding that sum on to the value of a used automobile, if that customer comes in with a car to trade, instead of with hard money to pay. And in a measure, we are here getting back of the entire trouble in the used car field, the inability of dealers to judge the value of a used automobile.

Some of this is due to lack of information, but a large part of it is the dealer's contribution to volume; the dealer is "buying his sale," or to put it in less elegant phrasing, "bribing his customer" to deal with him.

How are we to escape this situation? The remedy, in theory, is fairly simple, though its working out is going to occupy a period of several years and is going to be opposed quite generally, even by some of the bigger and better dealers and manufacturing organizations. Nevertheless, I believe that it will be accomplished in time and that when it has been done, used car losses will be insignificant compared to the losses at present. That principle is merely this:

THAT A DEALER WILL OFFER TO THE BUYER OF A NEW CAR JUST AS MUCH CASH, NO MORE, NO LESS, AS HE WILL ALLOW IN TRADE ON THE NEW CAR.

This will establish a "spot" price in the used car field, it will establish confidence in the new merchandise handled

(Continued on page 15)

Packard 122-In. Cars Being Groomed for Indianapolis Race

Engines Have a Bore and Stroke of 2.54 by 4 In. respectively and the Wheel-Base is 100 In. Cars Are Single Seaters. Weight Close to 1400 Lb. Minimum Limit

PACKARD will have three six-cylinder cars in the Indianapolis race this year. The cars are now at the Detroit factory receiving their final touches before being shipped to the Indianapolis track. The engines have a bore and stroke of 2.543 by 4 in., giving a displacement of 121.89 cu. in. They are 100 in. wheelbase. The cars are close to the 1,400 lb. minimum weight limit and, in fact, according to Vice-president J. G. Vincent, could have been made under this weight very readily, if the limitation did not exist.

Complete mechanical details are not available at the present time. It is known, however, that the general design of the engine follows along accepted racing car practice with an overhead camshaft and valve action designed along lines quite similar to those of the 300 cu. in. Packards. A plate clutch and four-speed transmission are used. The gear ratios have not been settled and will not be until after trial on the track.

The rear axle has an aluminum center housing with forged steel tubular mem-

bers. The service brakes are on the rear wheels and the hand brakes on the driveshaft. Particular attention has been given to the tire size and while the wheels are not altogether determined upon, as there are two or three sizes available, the tires are all over capacity for the weight of the car, so that it is anticipated that very good tire results will be obtained.

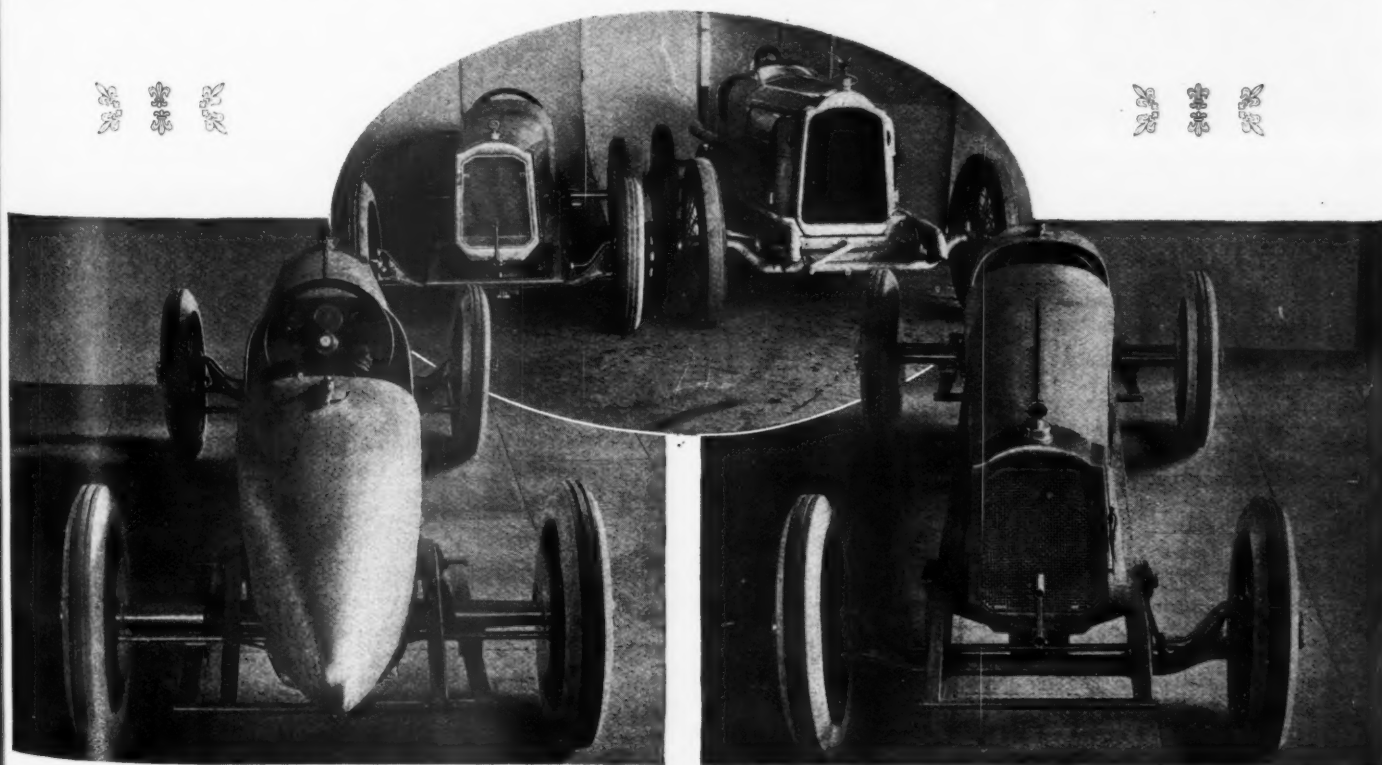
With the light weight, it is, of course, expected that fuel economy figures, which will differ materially from those of the larger cars, will be secured. The tank capacities are so arranged as to require but one stop during the 500 miles for fuel.

The drivers for the three cars will be Ralph De Palma, Joseph Boyer and Dario Resta. The cars were designed and to a large extent built in Los Angeles. Ralph De Palma, who has previously driven Packard racing cars, was placed in charge of the branch of the Packard Engineering Department in Los Angeles where he worked under supervision of J. G. Vincent. An engineering staff was

established in the Packard building in Los Angeles. A great many of the essential parts, however, were built in the Packard factory and shipped to Los Angeles.

In front appearance the cars resemble the standard Packard product. The Packard radiator shape is utilized and blends into the stream lines of the body. The spring suspension is an unusual adaptation of the semi-elliptic. As shown in the illustrations, no shackles are employed. The rear end of the rear spring, for example, pivots on the rear frame cross member and at the front end the rear spring slides through a slotted member to take up the elongation, due to deflection.

This year the cars will not carry mechanics so that it has been possible to get an extremely narrow, light body. Colonel Vincent predicts that while the speed in the larger cars may not be equalled this year, it is his opinion that within the next 2 or 3 years the previous Indianapolis track records will be broken by the smaller and lighter racers.



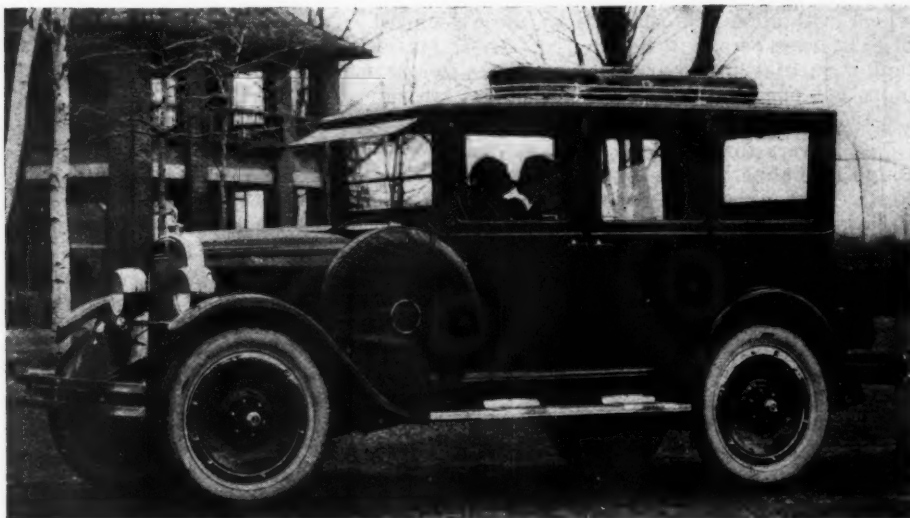
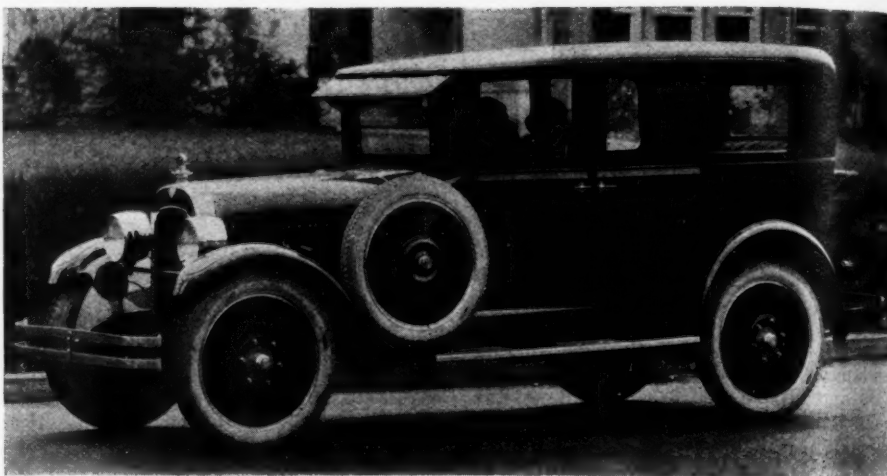
Several views of the Packard 122-in. piston displacement racing car built for competition in this year's 500-mile Indianapolis race. In the oval the little car is shown alongside the big Packard in which DePalma established records several years ago. Note that the tachometer is on the instrument board where the driver can see it easily. A clock is placed in the center of the steering wheel

New Passenger Car Models Announced

Add New Bodies to Maxwell-Chalmers Line

TWO bodies have been added to the Maxwell-Chalmers line. These are a five-passenger sedan type known as the Traveler on the Maxwell chassis, and a seven-passenger sedan on the 122 in. wheelbase Chalmers chassis. The Maxwell Traveler sells for \$1,635 and the new Chalmers sedan for \$2,095, f. o. b. Detroit.

The Traveler is designed along European lines with a luggage rack on the roof. It is finished in green gray with emerald green trim. The metal is all in nickel including the two bar bumpers which are furnished as standard equipment. The spare tire is carried forward of the left



front door in a cover that matches the color of the body. The rear trunk is also of similar color. The upholstery is taupe mohair. The rear seat is fitted with arm rests and there are two reading lamps, one in each rear quarter. The rear compartment is fitted with a vanity case and smoking set and there is a clock on the instrument board.

The Chalmers seven-passenger sedan is trimmed in gray mohair with satin finish hardware. Large windows, circassian walnut window stripes, dome light and two rear quarter reading lights are also features of the interior. The body and hood are town car blue with the superstructure in black. Nickered bumpers and a trunk are part of the standard equipment.

Studebaker Announces New Enclosed Model

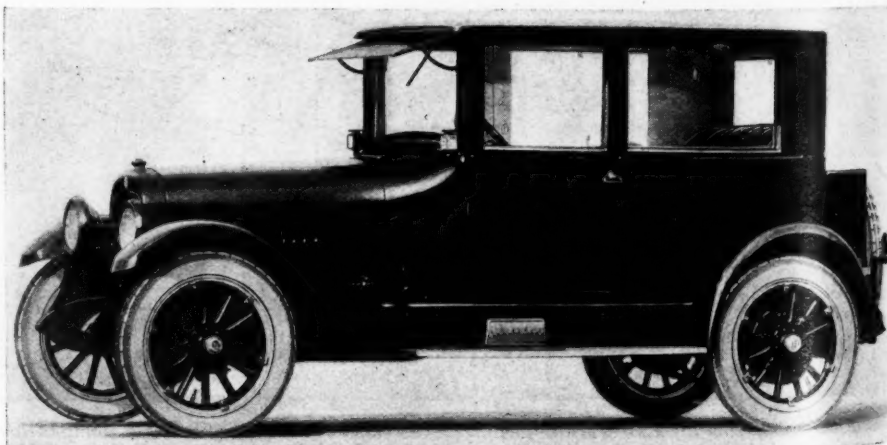
AN addition to the Studebaker line, the Special-Six five-passenger coupe, has just been announced. The price is \$1975, f. o. b. factory.

The Special-Six coupe seats five passengers. The rear seat extends across the full width of the body while the driver's seat and the auxiliary seat are of the bucket type and are identical in design and cushioning. Upholstery is in plain mohair velvet plush. Hardware and fittings are of silver satin finish.

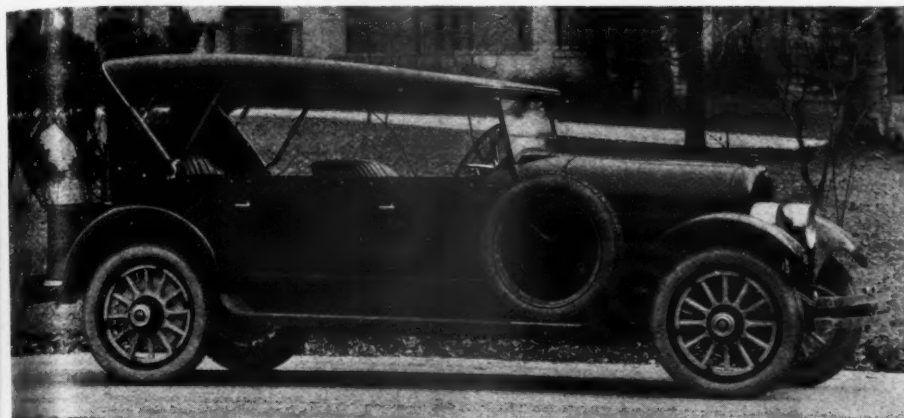
The new coupe carries a large trunk at the rear with dust-proof cover of the button-on type as standard equipment. It is also equipped with heater; jeweled eight-day clock; one-piece, rain-proof windshield with glare-proof glass visor; automatic windshield cleaner and rear-view mirror; American walnut all-wood steering wheel with new type spark and

throttle control; running board step pads and aluminum kick plates; flower vase; quick-action cowl ventilator; thief-proof transmission lock and other refinements that contribute to the comfort and convenience of the passengers.

The lighting equipment includes distinctive headlights, coach lamps, courtesy light on the driver's side to illuminate the roadway in passing other cars at night, frosted corner reading lights and combination stop-and-tail light.



Marmon Four-Passenger Speedster



A FOUR-PASSENGER speedster has been added to the Marmon line and will be ready for delivery in May. The car is designed along the familiar Marmon lines, but with the lines accentuated so as to bring out the speedster effect. In addition to the regular Marmon equipment it includes a special collapsible top with natural wood bows, polished protection bars at rear, trunk rack, trunk and tire carrier.

The price is \$3435 f.o.b. Indianapolis.

On page 22 of the April 12, 1923, issue, of MOTOR AGE two other recent additions to the Marmon line were shown. By error it was stated that both are mounted on a 132 in. wheelbase. This should have read 136 in. wheelbase, the size used exclusively by the Marmon company.

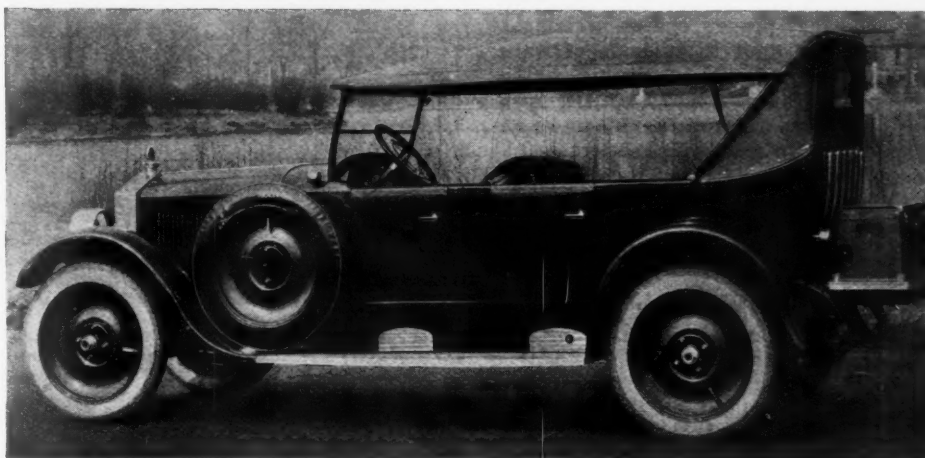
Moon Has a New Sport Phaeton

DELIVERIES are now being made by the Moon Motor Car Company of St. Louis on its new Sport Phaeton.

The 6-58 Sport Phaeton is distinctively a sport car, having full approved sport equipment. This new car carries seven passengers comfortably, it is stated, and is finished in milori green or maroon.

Equipment includes nickel head lamps, cowl lamps and windshield with nickel trimmings; polished aluminum body rails; trunk rack and trunk; six Distel wheels, and aluminum toe plates.

Price \$1995, f. o. b. St. Louis.



(Continued from page 12)

by the dealer, it will prove an effective argument against the long allowance on the over-priced automobile and it will enable the dealer to establish an accounting base for used automobiles without padding or fiction. So long as the dealer is calculating in terms of discounts, just that long will he be deceiving himself as to allowances, because the overhead and other expenses that come out of discounts are still hazy and intangible in his mind, but let him once get his used car purchases on a hard cash basis and he will be dealing with dollars and not counters. Dealers watch dollars much more closely than figures.

There is little apparent reason why the prosperity that will come to the manufacturers this year should not also be shared in fully by the dealers. There are the two important factors previously mentioned, the shortage of merchandise and the trend from open to enclosed cars. But lest the dealers let their enthusiasm run away with their vision, I would just recall to their minds that last year the dealers lost \$100,000,000 on used cars, and that if there is a 3,000,000 production schedule this year, and we handle the trade-in in 1923 as we handled it in 1922, "we ain't seen no used car problem yet."

Volume means profit to the factory, but volume will certainly not mean profit to the dealer, unless the dealer keeps the profit.

Building a Permanent Sales Force

BY doing everything in its power to implant a feeling of loyalty toward the company in the hearts of its salesmen, the Nash-Buffalo corporation, which distributes Nash cars in Buffalo and the territory contiguous to the city, has made considerable progress, according to S. Lee Abrams, retail sales manager for the company, in the solution of the problem of retaining salesmen indefinitely.

The company pays its men on a salary and commission basis. In addition to a substantial weekly wage, they get 2 per cent on sales up to \$25,000; 3 per cent on sales from \$25,000 to \$50,000; 4 per cent on sales from \$50,000 to \$75,000 and 5 per cent on sales exceeding \$75,000.

The year starts Nov. 1, so the salesman is assured of his weekly wage and what commissions he may earn during the comparatively dull winter months.

In the spring, if he has demonstrated proper zeal and initiative, he finds himself turning in business in sufficient volume to give him considerable income in commissions in addition to his salary and with prospects encouraging for increasing compensation during the big selling months of the year.

By the time fall rolls around he has likely reached the 5 per cent division and the money he has made during the

year, in connection with the co-operation he has received from the company, makes him so well satisfied with his connection he has little if any desire to try his luck elsewhere.

Consequently the company has been able to build up and to retain a sales force with much permanence in it and the salesmen as well as the company have benefited and are profiting by their prolonged relationship.

No commissions are paid to salesmen until the used cars taken in sale are sold. The company, not the salesman, appraises the used cars. The company maintains a separate department and a separate sales force for disposal of used cars. Salesmen in the new car department are permitted, however, to sell used cars, provided they do it outside the office, and are thus enabled to make extra money.

Some of the smaller private railroads in Denmark are using a number of low priced American automobiles by removing the rubber tire and replacing it with a flange fastened on the under side of the wheel.

New motor vehicle regulation for 1923 authorize the use of electric horns and other mechanical signals in French cities, thereby doing away with the bulb horn requirement of the past.

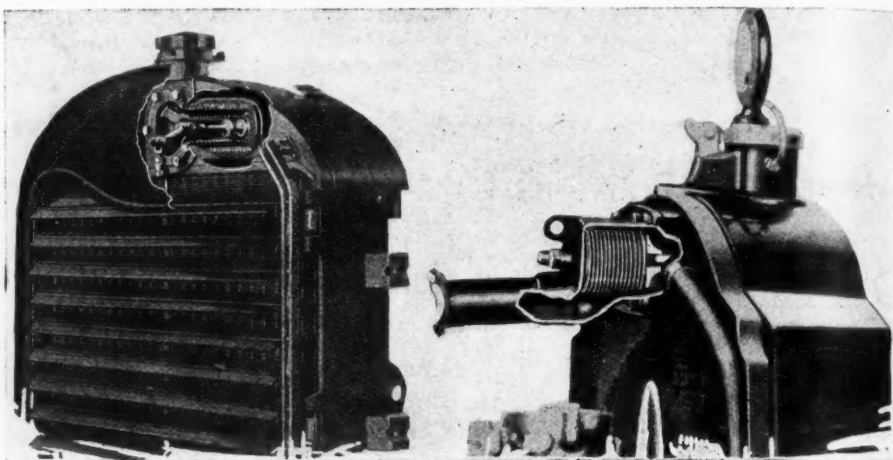
Some Things the Maintenance Man Ought to Know About Thermostats

Devices Intended to Shorten the Warming Up Period of Engines Are Practically Fool Proof, But Knowledge of Their Operation Is Essential. Some Used In Connection With By-Pass. Others Control Amount of Air Flowing Through Radiator

THERMOSTATS and valves are installed in the water circulating systems for the purpose of shortening the engine warming-up period. These installations function by preventing the water from circulating through the complete system until the engine has reached the proper operating temperature. They limit the volume of water to be initially circulated causing the engine to be brought quickly up to a properly working temperature. When an engine warms up quickly it has less crank-case dilution, less carbon formation and greater bearing life. Furthermore, an engine which warms quickly enables the car to be driven satisfactorily in a shorter space of time.

There is very little to get out of order on a thermostatic installation of this kind, but a great deal of harm can be done to the cooling system and to the thermostatic installation by a service man who does not properly understand the functioning of the system. The installations dealt with here incorporate the Sylphon thermostat, which is used in over 40 passenger cars, trucks and tractors. The installations are in general quite similar. There are, however, some distinctions which should be noted because they effect the operation of the thermostatic control.

The installations are generally so ar-

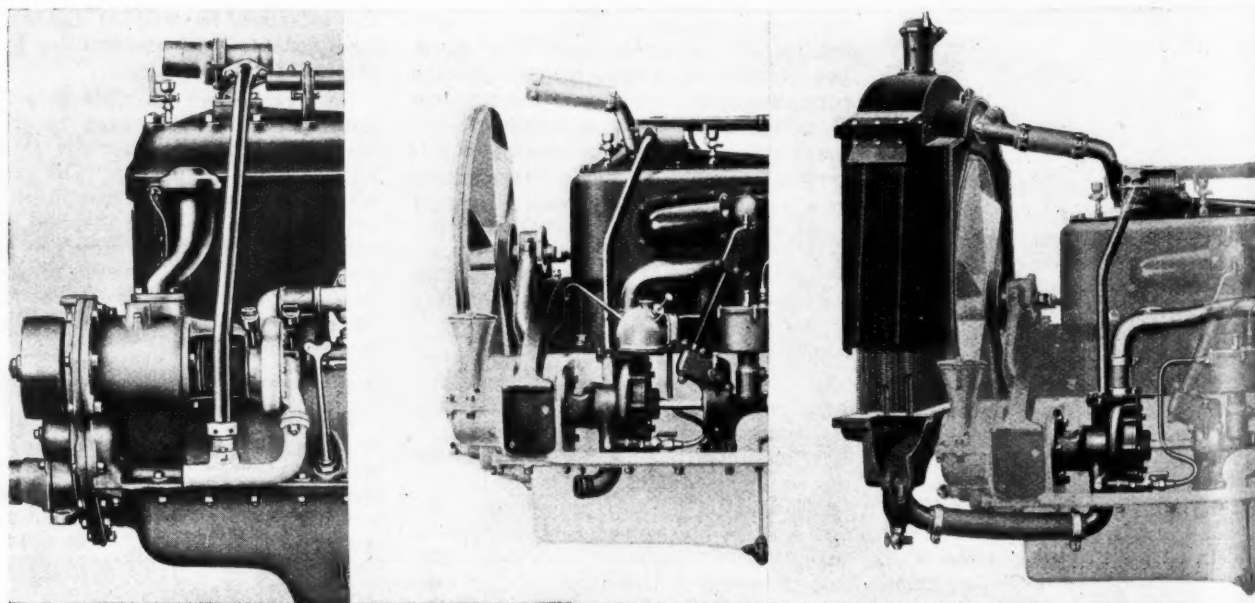


Left: Thermostat installation on the Lincoln car, showing linkage for operating the shutter. Right: Installation of thermostat on the Packard twin-six showing the instrument built into the radiator tank

ranged as to by-pass the water back to the pump instead of allowing it to circulate through the radiator. By-passing continues until the water becomes warm enough to operate the thermostat. Operation of the thermostat actuates the valves, permitting circulation through the radiator. Generally the thermostat is set to start operating at about 135 deg. Fahr. Until this temperature is reached, the water circulates only

through the motor, out the water outlet manifold to the thermostat, and then through a by-pass back to the water pump by which it is again circulated through the engine.

When the water temperature reaches 135 deg. Fahr., or whatever the temperature at which the thermostat is set, the valves begin to open and water passes through both the by-pass and through the radiator, until finally at about 170



Right: On the Packard single six the Sylphon thermostat is installed in the water header which is designed to accommodate it. Center: Thermostat installation on the Packard truck engine with by-pass to the water pump housing. Left: Buda bus engine with the thermostat mounted on the top of the water header. The by-pass is to the pump inlet pipe

deg. Fahr. the water in the radiator is brought up to the proper operating temperature, at which time the thermostatically controlled valve is altogether open and the water passes through the system with a clear, unrestricted flow.

There are a few installations which differ from this in that the installation is such that the water is circulated through the radiator and held stationary in the engine until the proper temperature is reached, at which time the radiator circulation begins to join the engine circulation. Practically the only important engine using this installation is the Paige. The principle is exactly the same.

Shutters on Radiator Front

Still another type of installation which may be termed an indirect water temperature control is used in connection with shutters on the front of the radiator. The thermostat is set so that it has contact with the water, but instead of controlling the volume of water passing through the system, it controls the amount of air which passes through the radiator by means of shutters. This sort of installation is used on the Lincoln.

The Sylphon regulator consists of three main parts as follows: 1-Sylphon, a one-piece, all metal bellows; 2-A valve for regulating the water flow; 3-A housing for enclosing the Sylphon. This Sylphon is a corrugated, expansible and collapsible metal bellows containing a highly volatile liquid, which, when heated, is converted into a vapor. The bellows has no soldered joints, being made in one-piece, formed into a number of folds or corrugations. It is powerful, direct and simple in action and responds to a slight change in temperature within its working limits.

The thermostat is active so long as the walls remain unpunctured. The bellows is held in a closed position by a powerful vacuum. When in this position, the valve is in such position as to

permit flow to the by-pass. Should the Sylphon become damaged in accident, allowing the volatile liquid to escape or vacuum to be destroyed, the Sylphon has sufficient inherent resilience to expand, fully opening the valves, allowing unrestricted flow through the radiator. This prevents any danger of damage to the engine from overheating.

The illustrations show a number of practical installations. On the Packard twin-six installation, Fig. 1, it will be noted that the thermostat is built and fitted to a place provided for it on the upper part of the radiator shell or tank. A by-pass pipe runs down the side of the radiator and it is through this pipe that the water is circulated until the temperature around the cylinder jacket rises high enough to operate the thermostat and shut the valves leading to the by-pass.

On the Packard single-six the thermostat is built into the water header on top of the engine. The by-pass pipe runs directly from the housing of the thermostat to the pump housing. A very similar installation is used on the Buda bus engine. The by-pass pipe in this case, however, runs down to the water inlet pipe rather than to the pump housing. The installation on the Packard truck engine is shown also. It is similar to that used on the Packard single-six, the by-pass pipe running from the water header into which the thermostat is built down to the pump housing.

By-Pass Valves Differ in Design

The different installations require somewhat different thermostat forms. The housings are different in shape and the arrangement of the by-pass valves also differs. On the Paige it will be noted that the normal position of the valve is closed. In this installation water is circulated through the radiator and held stagnant in the engine until the engine is warmed up. The water is forced from the pump around the radiator and back

to the pump again and only after the valve opens closing the flow from the pump, does the water circulate through the engine and radiator.

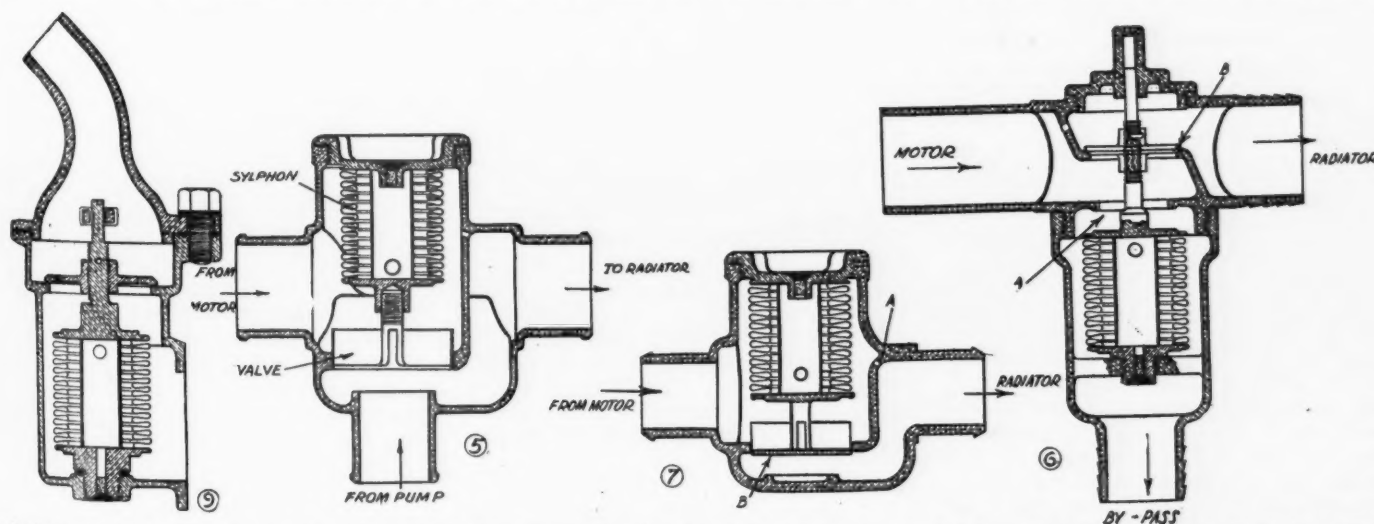
A much more usual type of installation is that employed in the Mitchell. Here it will be noted that the normal position of the valve is closed, permitting circulation of the water around the Sylphon and down through the by-pass. As the water temperature increases, expanding the Sylphon, the by-pass valve at "A" begins to close and the radiator outlet valve "B" begins to open until the temperature is up to its full running condition, at which time the valve "A" is closed and valve "B" is opened. Should any accidents happen to the Sylphon, the valve "A" would be immediately closed by the automatic expansion of the thermostat.

The Choke Type of Thermostat

A choke type of Sylphon thermostat has been brought out for cars not initially equipped with a thermostat control. It has a small discharge hole "A" through which the water is slowly pumped to the radiator. This is just sufficient to create a very small flow until the water is warmed up sufficiently to cause action by the thermostat, at which time the valve "B" opens, permitting direct flow to the radiator. This installation has proved suitable in cars which do not have excessive water pump pressure.

The Lincoln shutter installation, differs materially from the other installations, the construction of the thermostat being actually reversed, the fluid being in the housing around the outside of the Sylphon metal instead of inside so as to permit of the installation of the actuating levers on the shutters. The actuation of the shutter is by a vertical, central rod passing down in front of the radiator and this rod is connected to a simple shaft in the thermostat by means of a bell-crank lever.

The symptoms of trouble with a ther-



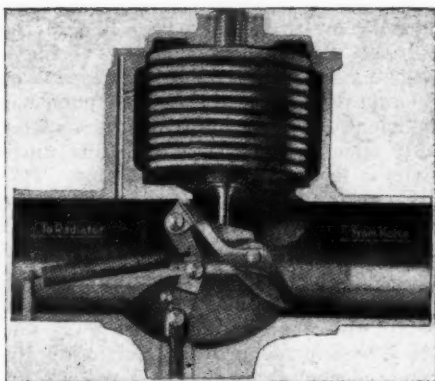
9—Thermostat installation on the water circulation system for the Studebaker light six. 5—Sylphon thermostat used on the Paige. This is an unusual installation because the water is circulated through the radiator, remaining stagnant in the engine until the proper temperature has been reached. 7—Thermostat for installation on cars which are not so equipped as standard. While the motor is cold the water is pumped through the small opening A. As the thermostat expands it opens the valve B, permitting unrestricted flow to the radiator. 6—Thermostat installation on the Mitchell which follows the usual practice on automobile engines. The thermostat is in proper position for a cold motor. As the water temperature increases, the thermostat expands closing the valve A and opening the Valve B, permitting the flow through to the radiator

mostat are practically always found in the non-operation of the unit. The warming-up period of the engine goes back to what it would be if the thermostat was not installed. Such a condition would indicate a possible damage to the Sylphon metal. Owing to the fact that it requires special manufacturing facilities to handle this metal and the fluid it contains, it is necessary to send the Sylphon back to the car manufacturer.

Taking the thermostat out is generally a very simple matter requiring the removal of not more than two or three nuts or screws. If the car is operated while the thermostat arrangement is off, the service man should see that the by-pass is closed so that the water is all circulated through the radiator. How this is accomplished will depend on the installation, but it is usually a simple matter to close the by-pass.

Rayfield Thermostat Novel in Design

In the Rayfield thermostat, made by the Beneke & Kropp Mfg. Co., Chicago, a



Sectional view of the Rayfield thermostat which shows the relation of the various parts

diaphragm made of special metal and containing a liquid sensitive to heat is used. When the water reaches the temperature at which the diaphragm is charged the latter expands and in doing this opens the valve which allows the water to circulate. If the water temperature drops the diaphragm contracts and

allows the valve to close. The diaphragm, which is similar to those used widely for heat control, is tested in manufacture and shows a life of from 500,000 to 1,000,000 contractions and expansions. In case the diaphragm should break or become inoperative from any cause, it is provided with means of automatic expansion and opening of the valve.

The valve is also provided with a means of opening independent of the diaphragm in case the pressure generated by the water pump of the engine is built up before the required temperature is reached. This arrangement allows of a pre-determined water pressure, ordinarily 7 lbs., to be reached before the valve will open, at which point it will open even though the water temperature has not reached the point at which the diaphragm will operate. These features insure freedom from difficulty of any kind as well as full automatic operation.

Ordinarily the Rayfield thermostat is introduced into the top hose connection and ranges in sizes from 1 in. to 1½ in.

An Ad a Week to Help Sell Automotive Transportation

What to Tell Car Owners in Your Advertising; the Kind of Copy That People Read

THE automotive transportation merchant has something in the way of advertising that is decidedly different from any other kind of copy which is offered to the public to read. While simple to prepare, it has its difficulties that must be overcome. The first thing to be considered is, of course, what people are interested in. As has been noted several times before on these pages, people are no longer interested in which is the best automobile in the world. If this were to be discussed frankly, one might truthfully say, "There ain't no such animal." Every car has its good points and there are some folks who wouldn't own a big car if it were a gift while they would pay twice the cost to get the small car they wanted and the case can be reversed.

The transportation merchant has something beside new cars to sell. His maintenance department must needs be an active part of his business if he is to survive. The selling of the service department to the public as a necessary part of the automotive establishment has yet to be accomplished. Many dealers long ago realized this and today these same men are sitting on top of the world, enjoying that prosperity which comes only when the complete confidence of the customer has been won.

Nor has this confidence been won by the sheer force of advertising, for to use an old proverb in a new way, "What does it profit a man if he advertise something that he cannot give?" You will not deny that many people are guilty of this offense. Not only in the automotive line is this true, but also in every other business. Advertising that you

"can give the best service at the least possible cost" when you are not equipped to do it is an out-and-out lie and will not be tolerated long.

The continued practice of this by dealers will soon result in having car owners refer to them as "gypps" and once this name is acquired, all the advertising in the world is not going to lift the stigma which it indelibly prints on the public mind. If you have not got a first-class shop, either make up your mind to get one and GET IT JUST AS QUICK AS YOU CAN, or get out of the race. If you are determined that automobile owners are content to have haphazard hands do their work, then you've got the wrong dope altogether.

In a very short time, you will go down as an "incompetent person" or a "gyp" and then, you are through. There is no chance at your coming back after you have earned the disrespect of the people with whom you are to deal.

The Proper Attitude for Approach

Your approach of car owners in this respect must needs be by courteous, helpful steps. You must remember that as yet, car owners are suffering from a lack of understanding of the service station. Worse than that, they are suffering from a fear, gained in the days of making, that they will be made the victims of a schemer, seeking to grab every penny that he can.

Our idea of how to erase this impression is to immediately seek the confidence of car owners, not by pleading, but by making an honest statement, in your own words of just how you feel toward the car owner.

Just where to start is pretty much a thing to be decided by yourself. You know the attitude of owners toward your place. If they come to you freely and discuss their problems, you have won a good deal of that coveted confidence. If, on the other hand, they are coming to you because they JUST SIMPLY CAN'T GO ANY PLACE ELSE, then you have a

task before you that means the making or breaking of your business.

It can more easily be made a case of making than it can of breaking. The latter can be accomplished only by complete indifference to the customer and your business while the former can be accomplished by such a simple thing as being on the square, first with yourself and then, as Willie Shakespeare so wisely noted, you can't help but shoot straight all the way along.

In this series, "An Ad a Week," you will find many things offered which may seem to you to be beside the point. If they disagree with your ideas altogether, then don't use them—we shall be grateful indeed if we succeed in nothing more than agreeing with you on one thing.

That one thing is that your establishment should be sold on the honesty of the man who operates it, on his ability to serve and his equipment to serve.

THE FIRST AD

The foundation of all success is honesty.

In selling the people of (city) on our establishment as the ideal one with which to do business we have done three things:

TAKEN A CAR TO SELL WHICH WE KNOW OFFERS A SPLENDID VALUE.

EQUIPPED A SERVICE DEPARTMENT WITH COMPETENT MEN AND TOOLS.

PREPARED A PROGRAM FOR PRESENTING OURSELVES TO THE PUBLIC, WHICH IS BASED ON HONESTY IN EVERY DEPARTMENT.

You will find here all the attributes to success. We believe in the ability of those who read this to know and appreciate our effort to give the people of (city) a real automotive transportation establishment.

THE RUNWELL SALES & SERVICE CO.

Some Things One County Association Has Accomplished

*The Meetings Are Held in Churches,
Perhaps That May Explain the Excellent Cooperation*

By CLYDE JENNINGS

IN a recent issue of MOTOR AGE we reprinted a letter addressed to the members of the Sullivan County, Ind., Automotive Assn. by the president urging a spring cleanup. It was a very good letter and we printed it because we believed that it constituted a legitimate association activity. The incident is referred to here because it is a homely illustration of a value that can arise out of an association.

There has at times been considerable discussion of the association field, what an association can do to promote the welfare of its members. Some dealers take the position that in an association they give good points to competitors and gain nothing. Such a dealer admits—just like that—that he is the best dealer in his community. Of course, the dealers who can qualify on this position are few and far between, so we will drop this part of the argument.

Even if a dealer did give and not receive anything in exchange, we believe that he would be the gainer, after all. We do not know of any community where there is not some criticism of some automotive establishment. Just think how much better the automotive dealer industry would stand in any community if all of the dealer establishments were 100 per cent, and how much this improved standing would benefit even the best dealer. It is a fact that many a good dealer is carrying a heavy load because his dealer associates in his community are not nearly up to his standard.

This load makes it necessary for him to work very hard to keep going, while if he could shift some of this load, he could be going ahead very fast with the same amount of energy.

Now we are going to let you in on the secret of what this story is about. We are reversing the Tom Wilder process of writing a fable and giving you the moral first and the story afterward. This story is not a fable, but a fact, and perhaps the writer has not the confidence in his story telling ability that Wilder has. Be that as it may, you already have the moral. Now for the story. It is about the Sullivan County Automotive Trade Assn.

Sullivan County is a more or less typical county for a midwest state. It has about 35,00 inhabitants, and the people live by coal mining and agriculture.

They Have a Song, Too

Tune: TIPPERARY

1.

*One day there came an auto driving
through our county fair,
All became excited and the news
spread everywhere.
Young and old of every kind fell for
the motor craze;
The "would be" business man, says he
"I wonder if it pays."*

CHORUS:

*These are the days it takes the money,
and we've thrown away our
book;
When they come in and ask for credit,
simply give a pleasant look,
For we have our association and we're
all feeling fine;
There's a great change in motor busi-
ness since we all got in line.*

2.

*The Studebaker, Overland, the Dodge
and Chevrolet,
Buick, Essex, Hudson and Fords are
in the way,
Durrant, Cadillac and Nash are present
here tonight,
Exide, also Willard Dilley furnish
them with light.*

3.

*There's Standard, Sinclair, Indian and
the bathing beach Sho Me,
Goodrich, Miller, Kelly and United
States Squeegie;
Shock absorbers, bumpers and the
whole darned line of stuff,
We have everything there is and that
should be enough.*

tion resulted with the following officers:

President, Harry Dilley.
Vice-President, Ed Wright.
Secretary, C. O. Hall.
Treasurer, E. E. Russell.

These officers made such progress during the first year that they were returned for a second term. Dilley, the president, is a battery merchant, and owns the only exclusive battery business in the county.

One of the results of the over-sharp competition was the price paid for used cars. It got to the point where practically every car dealer in the county had his profits wrapped up in used cars and some were not going to be able to finance their new car business for the coming spring. The friendliness brought about by the organization meetings immediately corrected the spite trading and put the business on a basis of, "If I cannot make that sale, let Jim make it and get a little profit out of it."

One of the first things that the association brought about was a realization that credit sales were sapping what little strength the wild trading had left with the dealers. An exchange of information indicated that the list of credit buyers at Jim's place was about the same as that at John's garage, and, consequently, the dealers as a whole were practically paying the expenses of a certain number of Sullivan County automobile users.

The result of this exchange is perfectly obvious. Each member resolved to stop contributing to the "Automotive Sponge Club" and all went on a cash basis.

Surprise No. 1. A cash business did not hurt business but did increase profits.

There had been an idea among the automobile and accessory dealers in this county that a man had to learn everything about this business by getting his own head bumped. But after profiting so greatly by an exchange of ideas among the members, it was decided to bring in people from outside the county to talk to the members and see if something could not be learned from the outsiders. The members were somewhat surprised to find that they could get as good a speaker as anyone, even if their association was small, and there has been a

In Sullivan, the county town, there is a railroad shop. It is rather a self-contained community. Terre Haute is the largest city. Will H. Hays was born and reared in the county and still maintains a law office there.

The association was organized Dec. 12, 1921, because some of the dealers in the county realized that competition had been carried to the extreme of personal unfriendliness. This unfriendliness was resulting in spite of business and these dealers realized that this meant ruin. So a meeting was called and the organiza-

speaker at almost every meeting for a year.

Surprise No. 2. A number of these visitors told of things that were directly helpful to business and saved a lot of experience headbumping.

Another activity that cannot be overlooked was the promoting of a show early in 1922. Most Sullivan dealers had regarded a show as a big town enterprise and were rather loath to tackle one in such a small community. But it was tackled and an excellent show resulted. Dealers came from Terre Haute and district travelers happened in. The outsiders told the Sullivan dealers what they had already realized, that theirs was a good show and that "big town stuff" only reflected the spirit of the dealers, not the size of the place. Along with the show enterprise came a recognition of the automotive association by other business organizations of the community and a frequent invitation to sit in on commercial meetings.

Surprise No. 3. The automotive merchandising business is one of the largest in the community and is recognized as a business by other lines when it is properly presented.

While this spirit of cooperation was being built up and the county town dealers were gaining a proper respect for their competitors in the smaller towns, and all were realizing that by a proper alignment among themselves they could make a better fight against outside influences, mail order and other home profit stealing influences, the money that had been tied up in used cars was being transferred to new buildings, better store fronts and trade efforts. All of this brought confidence and this spring, just before the Second Annual Automobile



This photograph was taken at the annual outing—it was not held in a church.
Top row, left to right: Claude Harmon; J. O. Boswell; R. W. Landen; Robert Beckett; H. M. Stewart; Ross Harbaugh; W. R. Johnson; E. E. Russell, Treas.
Middle row: W. E. Jones; Chas. Bledshoe; J. E. Wiley; Ed Wright, Vice-Pres.; C. A. Hall, Sec.; C. H. Stratton; Harry Dilley, Pres.; Walter Dixon.
Bottom row: Roscoe Crosson; J. E. Wees; Orville Underwood; Johnnie E. Rusk; Herman Fiddler.

Show, the big plunge was taken. The members decided that trading in used cars was not profitable.

Surprise No. 4. New car sales went on and someone else worried about the old car.

P. S.—Most churches in Sullivan have a social room with kitchen attached. The women of the church make a business of serving dinners for pay as an aid to raising church funds. The Sullivan County Automotive Assn. holds its meetings in

these rooms and the dinners are served by the leading church women of the community. How much do you suppose this accounts for the rapid progress of the peace-making spirit of the organization?

N. B.—Smoking is allowed in the church dining rooms.

P. P. S.—The membership of the association includes the commercial paper banker who handles the time sales for the local dealers.

23 Years Ago This Week In Motor Age

From MOTOR AGE of April 26, 1900

Here's an Ad Suggestion from "Way Back When"

The dealers in automobiles seem to have overlooked a useful point in not advertising more copiously, the special adaptability of their machines for Sunday use, says Harper's Weekly. The great objection of the more scrupulous Sabbath keepers to permitting folks to take their carriages out, has been that it made too much work for servants and horses.

The Father of the Used Car Problem

The things that automobiles are supposed to do by the none-too-well informed general public, are nothing short of marvelous. The project of a Painsville, Ohio, man appears however, to have reached the limit of sublime ridiculousness. According to an exchange, A. E. Allen, proprietor of a second hand store in Painsville, is building for himself an automobile in which he expects to make frequent trips to Cleveland and nearby towns. Mr. Allen believes \$1,500 is an exorbitant price to pay for an automobile

and is now at work on a vehicle which, when completed, will cost not more than \$75.

The various parts going into the car are being collected from all over the counties and all have at one time or another, seen service.

Haynes-Apperson Expands

The Haynes-Apperson company of Kokomo, Ind. have let the contract for a substantial addition, 40x100 feet and two stories high, to their plant, necessitated by the rush of orders.

Empire State Automobile Co. Is Organized

The Empire State Automobile Co. of Rochester is about to file articles of incorporation with the secretary of state's office to engage in the business of selling and manufacturing motors, automobiles and vehicles of every description.

Columbia Builds New Factory

The Columbia and Electric Vehicle Co., is breaking ground for a new factory at Hartford, Conn.

Olds Sales and Production for March Largest Recorded

LANSING, Mich., April 25—Sales, production and deliveries of passenger cars was the largest in the history of the Olds Motor Works, Lansing, Mich., during the month of March, sales department statistics show. April, it is said, gives every indication of surpassing March production.

The Olds Motor Works has been making passenger cars for nearly 26 years and last month, it is said, passed all previous records, the next highest month being March of 1920.

Within the last 30 days nearly every distributor handling Oldsmobile cars in the United States has visited the factory. All these men came to make arrangements for large deliveries and drive-aways during the summer months. Every one reported increased sales in his territory and predicted that the forecasts that 1923 would be the largest in the history of the automobile industry, would be true.

Demands for cars from the northwestern farm section of the country has been extremely brisk, it is said, and the sales in every other section have also shown material increases.

What Springfield Learned at Saginaw

*Trip to Birthplace of "Saginaw Plan" Gives
12 Dealers a New Point of View*

By W. F. DAGON

Secretary Springfield, Ill., Automobile Dealers' Association

WHEN twelve automobile merchants travel nearly one thousand miles to learn how other automobile men conduct their business, it is an admission on the part of those who made the trip that there is something wrong at home.

After nearly four years of continual wrangling over the used car problem, during which time the association has been standing on rather shaky ground, twelve Springfield dealers agreed as a last resort to visit Saginaw and learn at first hand what was being done there. For a long time they had heard that Saginaw had solved successfully the used car bugaboo, but the way it was being done had never been explained to them thoroughly enough to understand its workings.

Springfield has twenty-four dealers. Only twelve could be persuaded to make the trip to the Michigan city. Of the twelve, several had to be persistently persuaded before they agreed to give up two days' time.

Fourteen Springfield men, twelve dealers, a banker and newspaper man, found themselves alighting from a Michigan Central train at Saginaw on the morning of April 11. They were met by a delegation from the Saginaw association, headed by Guy S. Garber, J. J. Tompkins and R. P. Bishop. Breakfast was served in the Bancroft hotel, after which Garber and his associates outlined the Saginaw plan for the handling of used cars.

When the plan was unfolded it seemed very simple. Just an agreement among men that they would have faith in their fellow men, and conduct their business so that profits could be produced instead of losses. The Saginaw plan is after all just faith that the other man is honest in his dealings and is anxious to do things for the betterment of himself and all in his business.

The Springfield delegation was instantly impressed. They were beginning to see the light. If they could go back to Springfield and tell the dealers at home just how to go about righting conditions that have existed for years, it would make them exceedingly happy.

At luncheon, at the Saginaw Club, further details were given. Garber and several of the Saginaw dealers told what had been accomplished in their city. They stated that about eight years ago they were all standing close to bankruptcy, and face to face with the stern necessity of doing something. Like dealers in most cities they were overbidding, out-bidding and taking in used cars at prices that almost always meant a loss. Things were discouraging.

A meeting was called and the situation plainly exposed. From that meeting the Saginaw plan was born. Today the city is famous the country over for its successful automobile men, and its determination of a way to handle used cars at a profit. If there are dealers who are skeptical of the success of the dealers at Saginaw, a trip to the city and an investigation is suggested.

Saginaw dealers do not hesitate to buy used cars. They have a maximum price at which these cars are bought. Each dealer in the Saginaw association furnishes a list of what he will allow on cars of his kind. Each dealer is then furnished with a complete list of all cars sold by members of the association. Prices are quoted for models five years back. Every salesman carries a list of cars and their buy-in prices. No prices are made on cars not represented in Saginaw. The dealer uses his own judgment in matters of this kind.

The fixed take-in price is never violated by the members of the Saginaw association. Occasionally a dealer feels that his competitor has over-stepped his allowance, but the investigation committee invariably reports the deal has been absolutely on the level. The dealer who has lost the sale finds out he has been mistaken in his supposition, or in his salesman's report.

Nearly all the used cars taken in are put in condition, then sold at a profit. Immediately after a dealer takes in a used car he adds 20 per cent to its price. Should it be sold five minutes afterward it would have to bring 20 per cent more than it cost. Used cars are sold at a profit in Saginaw.

A visit to the stores of the Saginaw dealers showed all to be in a healthy, prosperous condition. Saginaw is no larger than Springfield, Ill.; it is not in as wealthy a section, yet its dealers make more money and stand better with their bankers than the dealers in Springfield. This means the business as a whole and not individuals.

The sole reason for the Saginaw dealers' success is in their method of handling used cars. They engage in no wild trading. They allow a fair price for used cars and they sell used cars at fair prices. The buying public who trades in for new ones—are usually pretty well satisfied with what they are allowed. The Saginaw idea can be used with success by any group of automobile men anywhere on earth. Financial success will

surely come to dealers who use the same good judgment and exercise the common sense displayed in Saginaw.

No attempt is made to regulate the prices at which new cars are sold. A dealer is given free reign here. But they all get the full list price, with the extra profits of a spare tire, bumper, spotlight and other extra equipment. No new car ever leaves a Saginaw dealer without an extra cord tire, and it is not a gift from the dealer either.

A "demonstrator" is defined as a new car that has been used by the dealer for a period of three months. There is no fixed price at which demonstrators are sold. It is entirely up to the dealer.

Saginaw dealers do not sell used cars for customers. The dealer will allow the salesman working on the deal to sell the customer's old car. But the dealer will not stand back of the deal, will not guarantee the car to whoever it may be sold. Neither will the dealer handle the note. That is entirely up to the salesman. Such a condition of affairs usually brings the customer round to seeing things the dealer's way and he then takes the dealer's fixed price. Buyers of used cars in Saginaw like the guarantee dealers give, for they know the firm means every word of it.

One of the most prominent bankers of Saginaw, addressed a joint meeting of the Saginaw and Springfield dealers at the Saginaw Club in the evening. He told his audience that automobile paper was eagerly accepted by his bank and other Saginaw banks, and that the automobile men of the city had a very high credit rating. In fact then stood at the top of the list among business men.

President R. Haas of the Springfield delegation. J. L. Elliott, vice-president, C. R. Constant, treasurer, and others in the Springfield crowd stated in the meeting that they were heartily sold on the Saginaw plan and would do everything in their power to put it into effect in Springfield. Eleven of the twelve dealers signed an agreement to carry out the plan. The dealer not signing admitted he was heart and soul for the plan but before signing it would be necessary for him to talk with his distributor.

Albert Rankin of the First National Bank of Springfield, also made an address in which he proclaimed his faith in the idea and hoped that Springfield dealers would adopt it. Rankin represents a bank that does business with a majority of the automobile dealers of Springfield. His influence on the dealers at home is counted upon very strongly by the men who made the trip.

A remedy had to be found to combat
(Continued on page 24)

A Flat Rate for the Electrical Shop

THE revival had been a great success. All coontown had been there but the following day the evangelist of darktown was stopped by one of the front row enthusiasts.

"Pahson," said the converted one, "Ah shu got religun fum you all's talk but since yisteday ah bin thinkin' sum bout wat you sed. Dat bruderly lub an' all dat 'shu fine, but wen it kum to givin' up mah pussonal weapons, fak is, Pahson, ah has mah doubts. Now, Pahson, jes foh onct tell de truff. Has you you-seff give up you slicah and da honey cubes?"

The Pahson hesitated between professional pride and the faint tickings of a deeply buried conscience.

"Tain't jes a fair question, Mose, mah proffession's lak dah doctah. If you is sick he say what you take to git well. Givin' him medicine aint gona help you none. Same way with me. Ah tells you sinnahs dah medicine you all need. Dat's mah paht ob de job. Den ef you doan git to hebben, Lawd knows ah done mah paht."

To practice what we preach is an ideal to which we would all like to conform. For some time we have been preaching that the right way to run an electrical shop or any other maintenance station was to have a flat rate basis, so that customers could be quoted a price for the labor involved. It is not our province, however, to say what such rates should be. Too many variables are involved in the different cars, the conditions under which they are serviced and the equipment and men available for the work.

On the question of electrical repairs, however, the matter is slightly different. In the first place, the amounts involved are smaller, so that if the rates do not just fit the shop in question they can be changed to conform to the economic conditions of the shop in question. Mechanical operations, on the other hand, are best determined by the factories making the cars, and many automobile manufacturers are already laying out such flat rate systems.

The following rates on electrical units

are given with the idea that they may serve as an approximation. At the same time it will be well for each shop using such rates as a basis to accurately check their costs for a period of time to see how such rates are working out. They are based on information from two electrical concerns, combined with our own knowledge of such work, and the time and difficulty of the various jobs. They will, therefore, serve as a basis on which to start and should guide the small shop in working out a flat rate system.

If you do not know whether to charge one dollar or fifteen, the table will tell you and will be approximately fair to yourself and your customer. If you take so long to do a job that you can not get by on the rates as given, you had better check up on your men and your equipment. There is a deficiency somewhere. Better find it before deciding the rates are too low, or you may drive your customers to a competitor, better equipped and more experienced in the work, and thereby capable of making money at prices you cannot touch.

{ SUGGESTED FLAT RATE BASIS FOR THE ELECTRICAL SHOP }																				
SYSTEM AND CAR	GENERATORS							STARTING MOTORS							MISCELLANEOUS					
	OFF AND ON CAR FINAL TEST ON CAR	RETIME IGNITION	REPAIRING AND BENCH TEST	EXTRA FOR SOLDERING COMMUTATOR	EXTRA FOR TURNING AND UNDERCUTTING COM.	EXTRA FOR PUTTING IN FIELD COILS	ADJUST CHARGING RATE ON CAR ONLY	OFF AND ON INC. BENDIX, REMOVAL	BENDIX ONLY OFF AND ON	BENDIX REPAIRS AFTER REMOVAL	REPAIR STARTER	EXTRA FOR SOLDERING COMMUTATOR	EXTRA FOR TURNING COMMUTATOR	EXTRA FOR PUTTING IN FIELD COILS	TEST ONLY ON CAR (NO OTHER WORK DONE)	ADJUST CHAIN	INSTALL CHAIN ONLY	REMOVE CLUTCH	PUT NEW PARTS IN CLUTCH	REPLACING COMMUTATOR, END BRACKET CASTING ONLY
FORD	1.00	—	2.50	1.00	1.00	1.00	.75	3.00	1.25	.50	2.00	1.00	.50	1.00	.75	—	—	—	—	—
DODGE 1917-22 NORTH EAST MODEL G	2.00	—	3.50	1.00	1.00	2.50	.75	—	—	—	—	—	—	—	.75	1.00	1.50	—	—	1.50
DODGE 1916 NORTH EAST MODEL D	3.00	—	5.00	1.00	1.00	3.00	—	—	—	—	—	—	—	—	.75	1.00	1.50	—	—	2.00
CHEVROLET 1916-22 AUTOLITE	1.00	1.00	2.50	1.00	1.00	1.00	.75	1.50	—	.50	2.00	1.00	.50	1.00	.75	—	—	—	—	—
EARL AUTOLITE	1.00	1.00	2.50	1.00	1.00	1.00	.75	1.50	—	.50	2.00	1.00	.50	1.00	.75	—	—	—	—	—
BUICK 1917-1922 DELCO MOTOR GENERATOR	2.50	1.00	3.75	1.50	1.50	1.00	.75	—	—	—	—	—	—	—	.75	—	—	3.00	.75	—
HAYNES MODEL 55 LEECE NEVILLE	1.00	1.00	3.00	1.00	1.00	1.00	.75	1.50	—	.50	2.00	1.00	.50	1.00	.75	—	—	—	—	—
CADILLAC 59-1920-21 DELCO #162 MOTOR GEN.	2.50	—	4.00	1.50	1.50	1.00	1.00	—	—	—	—	—	—	—	.75	—	—	3.00	.75	—
CADILLAC 61 1922 DELCO #98 MOTOR GEN.	3.50	—	4.50	1.50	1.50	1.00	1.00	—	—	—	—	—	—	—	.75	—	—	4.00	.75	—
JORDAN F AND M X DELCO	1.50	—	2.50	1.00	1.00	1.00	.75	1.00	—	.50	2.00	1.00	.50	1.00	.75	—	—	—	—	—
NASH 1917-19-8-22	1.50	—	2.50	1.00	1.00	1.00	.75	1.00	—	.50	2.00	1.00	.50	1.00	.75	—	—	—	—	—
STUDEBAKER 1920-22 REMY & WAGNER	1.50	—	2.50	1.00	1.00	1.00	.75	1.75	—	—	2.50	1.00	.50	1.00	.75	—	—	—	—	—
REO 1920-21 N.E. MODEL (L) GEN.	1.00	—	2.50	1.00	1.00	1.00	.75	1.75	—	—	2.50	1.00	.50	1.00	.75	—	1.50	—	—	—
REO N.E. MODEL L.R. WITH 16N.	1.00	1.00	3.00	1.00	1.00	1.00	.75	1.75	—	—	2.50	1.00	.50	1.00	.75	—	1.50	—	—	—
MAXWELL 1920-21-22 JIMMIS HUFFE AUTOLITE	1.00	—	2.50	1.00	1.00	1.00	.75	1.00	—	.50	2.00	1.00	.50	1.00	.75	—	—	—	—	—
CHALMERS 1918-22 WESTINGHOUSE OR AUTOLITE	2.50	1.00	2.75	1.00	1.00	1.00	.75	1.00	—	.50	2.00	1.00	.50	1.00	.75	—	—	—	—	—
HUDSON 1917-22 DELCO MOTOR GEN.	2.50	—	3.25	1.00	1.00	1.00	.75	—	—	—	—	—	—	—	.75	—	—	3.00	.75	—

Maintenance as a Part of Car Design

How the Franklin Company Engineering Department Got Together With the Service Men and Designed and Built a Product Easier to Get At

"PUT yourself in place of the repairman" was the slogan of the engineering department of the Franklin company when it designed the Series 10 Franklin. Parts were designed and units grouped in such a way that when repairs and adjustments were necessary, related parts would be disturbed little, if any.

The conception of the new series Franklin began when the men who are in charge of design and engineering got together with the men who service, men who as a rule are experienced in the problems of repair and maintenance stations. By thus working hand in hand the designers got what they thought was necessary to good performance and at the same time the maintenance men got what they knew was needed to make the service as efficient as possible and the price of repairs as low as possible.

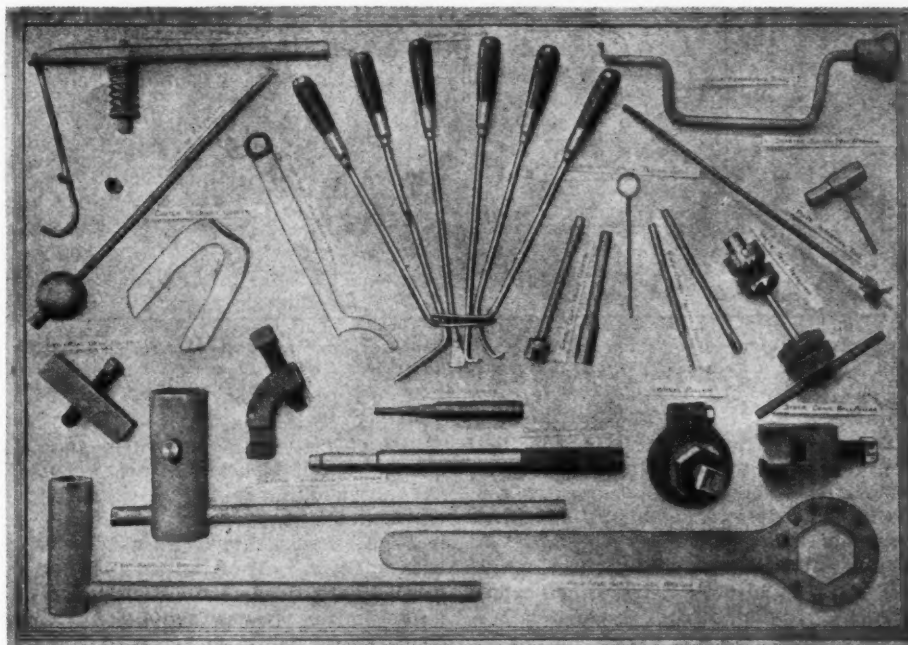
All of this resulted in the Franklin company issuing a book to all members of its organization, including the dealers, maintenance men and others. This book sets forth the features of design and construction which appeal particularly from a maintenance point of view. It shows, for example, how adjustments which formerly took hours to make now are a matter of a few minutes.

The construction of the generator drive sprocket is typical of this. A cross-sectional view of this is given on these pages. It will be noted that the sprocket is so arranged that the generator can be removed without disturbing the sprocket or chain and thus upsetting the timing. The view also shows the hardened plug forced into the end of the sprocket and the hardened plunger set in the check piece pressed against this plug by a spring, thus taking up the end thrust on the shaft. In adjusting the generator chain the front nut on the pivot bolt and the cap screws, at the top of the generator mounting flange, are loosened and, to take off the generator, they are simply removed.

If desired, after the generator has been removed the car can be driven. This brings out the valuable service feature making a big appeal to the car owner.

Every cylinder hold-down nut, every valve tube yoke nut and every manifold nut is easily accessible without disturbing any other part of the engine. The absence of the metal deck, of the suction yoke heater pipes and the controls, the simplicity and location of the carbureter itself give this accessibility. Instead of cap screws in the suction and exhaust yokes, bolts and nuts are used, eliminating any possibility of any cap screws breaking off in the cylinders.

The high tension wire conduit does not have to be removed. It is below the manifolds and out of the way. In re-



A collection of the special tools and fittings which the Franklin factory service department evolved for servicing the series 10 model. Each is designed to speed up a certain job

moving or putting back the valve walking beam mechanism, the spiral wire spun around the tubes gives an air-tight joint between the tube and air housing, doing away with all the trouble and time spent in fussing with the old escutcheons and cotter pins which were used to perform the same function.

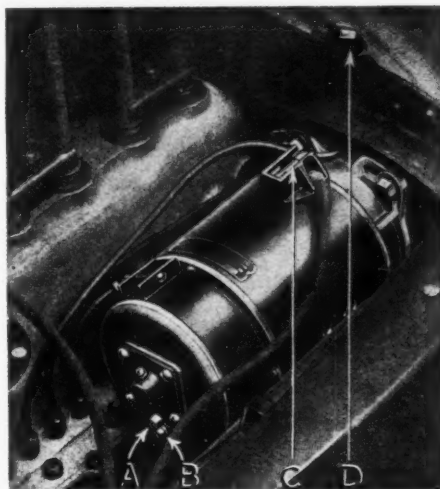
Any cylinder can be pulled without disturbing any adjacent part of the engine, even numbers three and four, which are close to the carbureter. It leaves the

piston easy to handle and, on top of all this, the piston has been equipped with a floating pin which means simply slipping off the retaining ring away from the ends of the pin and slipping it out.

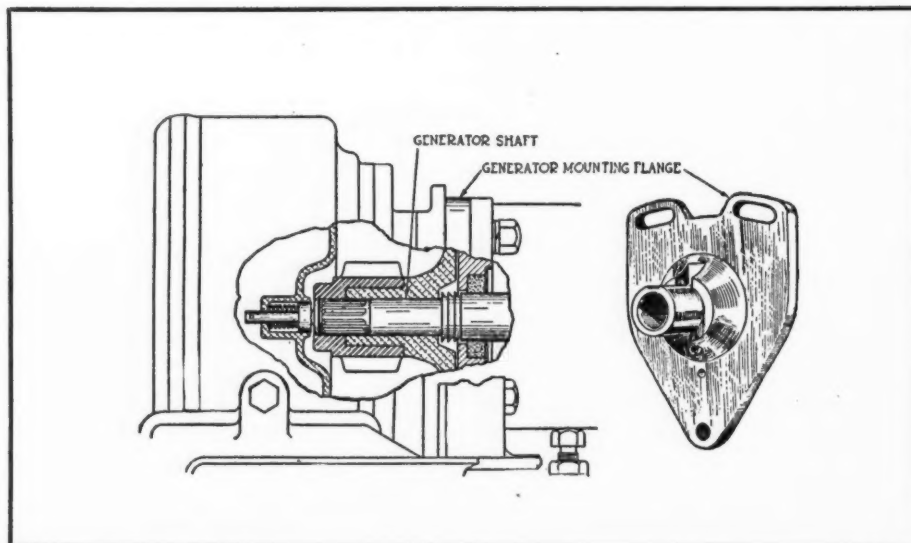
Aside from building service into the car, the factory service department has spent much time in designing and trying out a complete set of tools to enable the workman to much more efficiently and quickly carry out the various adjustments and repairs which might be encountered in service.

Certainly it inspires confidence in the customer when he knows that the best possible equipment is being used when any work is being done on a car in which he probably has considerable pride. The special tools designed by Franklin for its maintenance departments take in such items as a clutch hold-out collar, rear axle hub retainer wrench and steering arm puller. The full set is shown in the illustration.

There are a lot of little refinements which have been carried out in the series 10 Franklin which mean a lot to the service man. For instance, the left knuckle arm has been shortened so the dust cap will not hit the spring clips and be torn off. The shearing off of the teeth on the emergency brake quadrant rack has been overcome by the use of flexible cable connection instead of tubing. The cable used is easily adjusted for length by removing a pin, pulling up the cable to the next hole and reinserting the pin.



The generator as it is attached to the engine. A is the locking screw and B the third brush adjusting screw, both accessible. The 6 amp. fuse is shown at C and the generator chain inspection hole at D



Cross section view showing sprocket which drives the generator and so arranged that the generator can be removed without disturbing the sprocket or chain and thus upsetting the timing. End thrust is taken up by a spring

The new carburetion device on the Franklin does away with many repair operations. There is now no valve for the intake manifold heater, all the heat from the exhaust passing through the heater. The absence of the valve eliminates rattle and does away with the necessity of freeing the valve when it becomes struck.

Also the velocity and heat of the exhaust gases is said to keep the manifold

heater clean. The heater valve and two exhaust manifold heaters, formerly used, have been eliminated. The connections between all these parts were liable to leakage because they could not be sealed with gaskets. All of the exhaust is now carried back through the muffler and all joints in the system are bolted flange connections, using gaskets. This naturally does away with any previous trouble of blowing out the packing in the old

gland connection between the exhaust pipe and yoke. It makes it easier to remove the exhaust pipe.

The adoption of the grounded system of wiring in the Franklin has been a big help to the maintenance man. Furthermore, wires of the different circuits are given a different color, which makes it very easy to trace any given circuit. The terminals of the fuse blocks on the junction board have been marked showing to what circuit the attached wires belong.

The factory service department, along with the other work of designing an adequate set of special tools, shown herewith, has made up a small bulb test lamp with handy clip terminals, one of which can be quickly snapped on the ignition head terminal and the other grounded. As the engine is being cranked over or the ignition head rotated, this bulb will light at the firing point of the stroke. This does away with the operation of removing a spark plug wire in checking or setting the ignition. A further advantage lies in the fact that the bulb can be brought to any point where it can be most easily watched.

In the preparation of this booklet the Franklin Company contemplates its distribution to not only its own dealer maintenance organizations, but to other maintenance organizations, service managers and schools. The company is prepared to mail the booklet to all executives of other dealerships or maintenance establishments upon request.

(Continued from page 21)

the trading evil which has made business in automobiles unprofitable in Springfield. Last winter much time and money was spent in trying to establish a used car market here, but the proposition fell through after weeks of wrangling.

Today Springfield dealers feel that they are standing on the threshold of a new era. The trip to Saginaw has accomplished what years of work has failed to do; it has found a possible solution of the used car problem, the thorn in the side of the automobile business. Springfield says it is coming out of the red ink class on used cars from now on, and that a different report will be made a year from today.

The Saginaw dealers treated their visitors royally. Garber, Bishop, Tompkins and several other dealers gave up the entire day to showing the Springfield dealers about. Garber stated that many committees had visited Saginaw, usually in twos and threes, but that Springfield delegation was the largest that had yet made its appearance.

One thing is certain: If Saginaw dealers can make money by following out a simple idea then dealers in any city can do likewise. It behooves dealers everywhere to show the common sense and faith in their competitors that Saginaw dealers have. It will take the grief out of the automobile business and put smiles on dealers' faces who haven't had a happy laugh for a long, long time.

Dan's Diary

APRIL 20—The Boss was riding me pretty hard today to get all them jobs out. Me thinking Heck wots the use Wot do i get out of it. Im there breaking my neck so he can make a bunch of coin and i cant get time to see my girl a tall. Two years ago when i started working for this bird he was peaches and cream. He worked in the shop with me and when we worked together all night it



was fun, but working alone all night alone is no fun while this bird goes home and pounds his ear and then comes back in the morning and cusses cuz the work aint done me having bum luc. He's been reading all them trade papers about merchandising and asking 'em to buy and keeping records and flat rates and he's so buzy filling out blanks and checking up my time to find the overhead that i haf to do all the repair work, grind out gas and oil and sell accessories till i'm pretty near crazy, him smoking segars, stalling off salismen and other important things which I might mention, talking

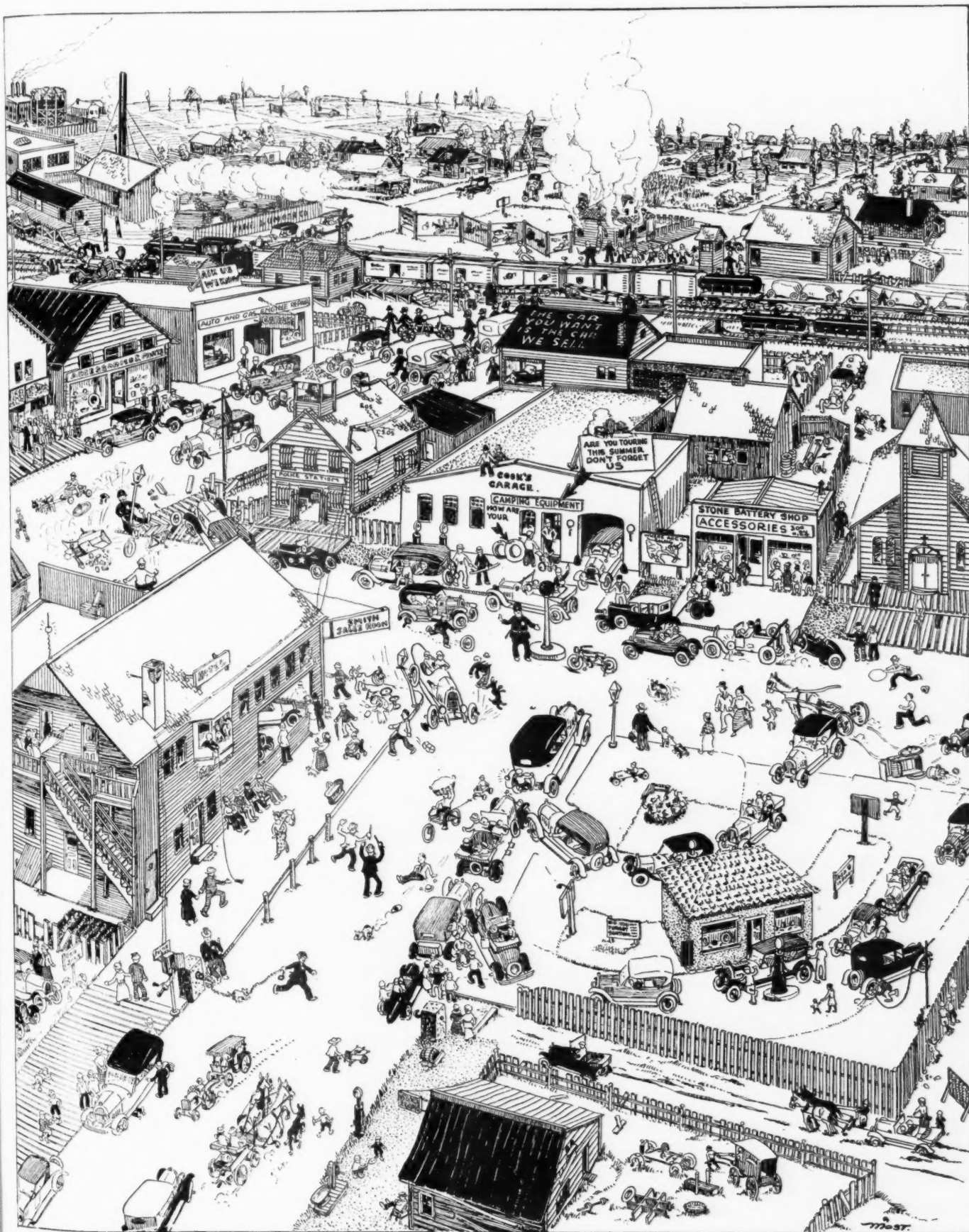
sily to that grass window which comes around every day pretty near almost for instance.

I'm going to get a new job as the season opens up unless he turns over a new leaf. It will cut down his overhead quite a bit if I quit getting all the money and not having to pay me none for loafing around as he calls it.

April 24—I got balled out again today, me not having a job done that the Boss promised at noon on account of getting one done that I promised myself. The big cheese never told me nothing about it and I told him about it while he was balling me out right before the customer him being so mad he had his mouth open to fire me but before he done it he wonders who will do the job so he closes it gain and swallows hard and promises the job at 6 o'clock p. m. I'm going to quit at 5:30 and wash up and go and see me girl to-morrow nite like other guys does. mabe if i get him mad enough he will tie the can to me. I hate to quit on him kinda liking the old stiff.

At the Annual Automobile Exposition, Amsterdam, Holland, this year, 23 makes of American cars were shown out of a total of 63 exhibits. These were by far the best sellers. American accessory exhibits were small however, and were by no means representative of the large quantity used in the Netherlands.

Sunday Afternoon in Gasville



MOTOR AGE'S PICTURE PAGES



New York City will soon have its first fleet of woman piloted taxis. Hundreds of women applied for the work but preference was given to those who had had driving experience in war work. Among this group, now in training, is Maude O'Dell, the English actress, who did air raid duty with the Women's Legion and won the Sandow Gold Medal. She may be seen here, at the wheel, dressed in the khaki uniform of the new taxi service



Use of motor trucks, or lorries as they are called there, is increasing rapidly in England and to meet the demand for quick service the F. W. D. company has put this "Service Van" on the road. It is equipped with spare parts, tools and mechanics to handle repair work and has proved so successful in building up confidence in the F. W. D. trucks that the company contemplates installing several more



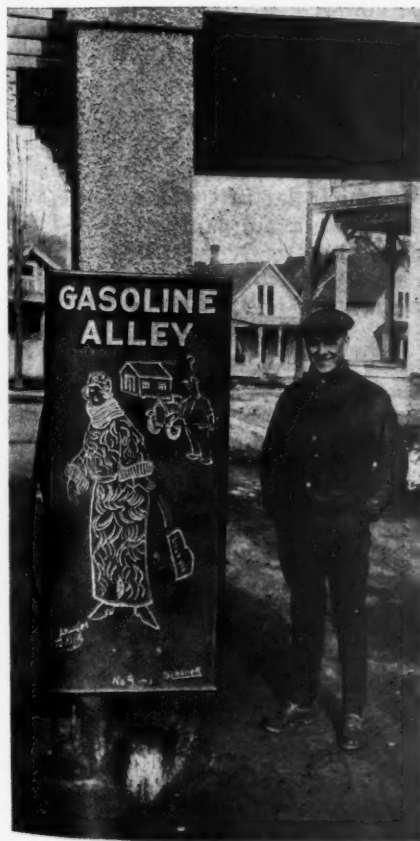
Paul J. Killen, of Galesburg, Illinois, who has been elected President of the Illinois Automotive Trade Association for 1923



S OF AUTOMOTIVE INTEREST



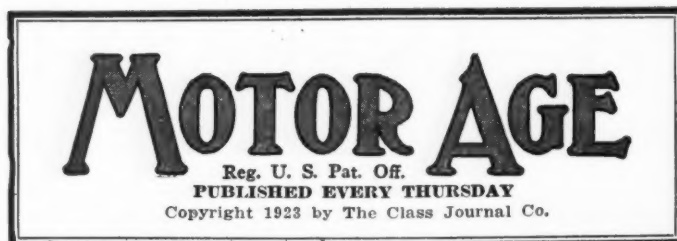
Along the roads about London, England, one does not find "everybody" driving automobiles. They get along with anything at their disposal. The rule of the road here is the reverse of ours, it "is keep to the left"



Eugene Field, a clever amateur artist out in Sioux Falls, S. Dakota, has a novel way of "asking 'em to buy." He calls his filling station "Gasoline Alley" and every day on his blackboard, he shows some new phase of Frank King's nationally famous series, featuring Walt, Skeezix, Mrs. Blossom and the rest of the "Alley" gang



Two views of a road showing what can be done without paving. Drainage and regular maintenance are the factors which transformed this mud hole into a boulevard at very slight expense. It is Avery built. Wisconsin has carried this idea to a climax on its system of State highways where complete maintenance including road gang work was \$254 per mile in 1919. Patrol maintenance was averaged only \$144 per mile



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Small Change

NOT long ago a well-established dealer handling a popular, medium-priced automobile was asked if he sold tires. He said that he did not, that his establishment was adjusted to selling cars and that tires and such things were small change. This dealer had something like 800 cars running in his territory at the time.

He was asked what a tire for this car cost, and at that time the price was about \$32.50. Then he was asked to figure what the sales of tires for these 800 cars would amount to, at the rate of two and a half tires a year to the car. He did some figuring and then abruptly ended the conversation by walking away. It might be small change, but there is an old adage about caring for the pennies and the dollars will care for themselves.

Only a few days ago another dealer in the same car referred to in the above paragraph said that he had 700 cars running in his territory, most of which he sold. He was asked if he sold tires.

"Yes, and accessories, too," and he added: "Last year, despite a bad start and much unemployment in our community, we sold \$100,000 worth of tires and accessories and this year we expect to run more than \$150,000."

Small change, think of it!

Both of the cities referred to above have had very high competition in used car buying and have had a heavy dealer mortality.



What does your window say to the car owner?



A Flat Rate Thought

WHEN Percy Chamberlain, as manager of R. R. Hall & Co., in Denver, devised the flat rate as a method of selling Cadillac owners in that city, he had no rules or books to go by. He had an idea and the rates that he made out for certain repairs were made from experience of his own men in his own shop.

He did more than merely make some rates. He applied the rates that he had worked out to the work within the shop as a basis of compensation for the men he employed. In a very short time he had what was then, perhaps, the most efficient maintenance shop in the country.

Chamberlain was handicapped with the difficulty of selling the flat rate to men in the shop who had never heard of the flat rate. At that time the rate method of a wage basis was an entire experiment in the maintenance industry. It was necessary then to sell to these men the idea that double their wage should be charged the customer for the labor. It was necessary to take up such small matters as brooms, to show to the men that there were charges that the management had to pay for letting them work—overhead or unproductive expense that must be compensated for if the establishment was to survive.

Chamberlain did all of this in this shop and he has later sold the idea to many other shops. He was a pioneer and for many months he had practically no support in this idea except that which was accorded to him by MOTOR AGE. But the idea was fundamentally right, as the extent to which flat rate is practiced today proves. An idea that is not fundamentally right or practical cannot endure the steady growth in the face of such severe criticism as the flat rate has had. The development proves that the idea is right and it will in time prevail.

The point we wish to make here is this:

Chamberlain had no help, yet he made his plan workable. He did it out of the experience records of his own office. Today, many maintenance dealers and executives assert that they are for the flat rate, that they believe in it and want it in their shops, but they want someone to come to their shops and put it into practice and to guarantee to them that it will work, and to come back and point out the faults.

We believe that the only way to get the flat rate to going in your shop is to do like Chamberlain did: Make it go. With the wealth of data today to assist, what excuse is there?



In time of slack, prepare for business.



Gold Bricks

THE salesman makes a living by selling, and while methods by which goods are sold have changed a great deal in recent years, there are still salesmen whose chief aim in life is to fill up the shelves of their

customers. Small matter whether the shelves are ever visible again or not, just so the immediate order is obtained.

The sale of accessories is one of the main sources of dealer profit, but if good will is to be built up at the same time, the line should cover usable articles, not junk. Many shelves are filled with doubtful goods; for example, devices supposed to make the spark longer, fatter, redder, bluer, or give it some other quality designed to give greater power or mileage from the fuel.

But why buy on selling talk? Analyze the story from a fundamental basis. Is the device going to provide more heat units than were originally in the gas, and if so, where do they come from? The dealer is not often a technical man, but he may have at the head of his shop a man who, through study and practical experience, knows whereof he speaks. Why not call him into consultation when the leach salesman gets you by the throat? Snap judgment is often snap foolishness.

If the device is based on sound principles you can sell it to your customers with the conviction that you are doing them a favor. Otherwise you do not want it, no matter how attractive the proposition may seem to be, or how large the margin of profit.



There is such a thing as buying in too many places.



Your Community

WHENEVER it gives you such a feeling of contentment merely to walk or drive around a town that you would like to stay right there and make it your home and bring up your children in the wholesome atmosphere that surrounds and permeates you, it naturally causes you to inquire what makes a town like that.

They have a town like that at Middletown, Ohio. It is not a large city, nor is it a village. Citizens tell you the population is between 25,000 and 30,000. We enjoyed the hospitality of everyone of them and observed their remarkable achievements during their entertainment recently of the National Conference of Business Paper Editors.

If you are a stranger in the town, as we were, and go to the new hotel which in reality is a community enterprise, you get your first lesson in the spirit of Middletown. You are amazed at the simple elegance, the physical beauty, the complete equipment, the "good morning" service of this institution far beyond what one would expect to find in a city of that size and in reality rarely finds in any city.

The citizens are glad to tell the reason for it. They believed business visitors to their city, of whom there are many because of surrounding manufacturing interests, were entitled to comfort, convenience, cheerful service, good food and pleasing rest. They got together and built this hotel on a scale that no individual would have considered a profitable business venture. Nearly everybody bought stock, not as a selfish investment, but as an act of civic pride and helpfulness.

The hotel was built. Then came opening time. A committee of citizens decided upon a celebration that is typical of Middletown enterprise. The hotel rooms and suites were sold for the opening week to citizens of the town. Every bit of space was taken and nearly everybody moved in for a gala week. It was a mar-

velous aggregation of neighborliness within the four walls of that handsome eight-story building.

Thus was the hotel dedicated as a monument to a most unusual exhibition of civic pride, and the more practical purpose of filling the cash drawer to start off was accomplished.

This is merely an example of the things they do to make Middletown the kind of city you like to be in. They recently had a baby parade in which 300 mothers marched with their little ones in carriages. Community games and contests for their children are conducted under trained and paid leaders. There's an old swimmin' hole in the park and Boy Scouts and the Camp Fire Girls are powers in the community. A community fund of more than \$1,000,000 was raised to build a Y. M. C. A., a high school and other needed improvements. There is a commission form of government and old residents said they had never heard graft charged against one of its members.

There is a background of industrial enterprise—large and small productive factories with a consciousness of their responsibility to the community that gives them a home and provides the labor and industry to make them profitable.

Harmonious cooperation is the secret of this happy town. It is within the power of business men in any town to emulate this example and in doing so they cannot fail to improve business conditions, just as progressive automotive manufacturers and dealers are helping to do in this town.

And practically every house in Middletown has its garage.



It is a protection to the dealer when the jobber tries to prevent unpaid accounts running too long.



A Railroad Truth

IT is refreshing to sometimes find a man who can view business other than his own with equanimity.

We have become so accustomed to jealous and silly remarks about motor trucks from railroad men that we rather expect that sort of comment whenever a man interested primarily in railroads talks in public. Recently there has been something of a change of vision among railroad men, but few are outspokenly friendly to the truck.

Now comes Samuel Vauclain, head of the Baldwin Locomotive Works, one of the biggest of all railroad institutions. His business is selling locomotives to railroads. Is he scared of trucks? You would think he would be when so many of the railroad men themselves are talking in shivers. It seems not, for this is what Mr. Vauclain said in an interview recently at New Orleans:

"Motor truck freight lines were going to put railroads out of business? Ever see the Mississippi River out there? Every hour pour a glass of water into it and watch the difference it makes. That's the way motor trucks will change railroad business."

If the automotive industry was as touchy as the railroads, they might resent comparing the great fleet of trucks with a glass of water, but certainly this attitude is better than that of the scared railroad official.

April May Exceed 350,000 Mark

Present Rate of Production Far Ahead of Expectations

Trucks, Tractors and Cars, All Share Well Distributed Demand

NEW YORK, April 23—At the present rate of production, the March record of 346,000 cars and trucks may be exceeded in April, despite the fact that this is a short working month. The increase in factory schedule is apparent principally among the smaller producers, the major plants having traveled along at relatively top-notch speed for some weeks, being limited in their operations to a certain extent by a shortage of labor and difficulty in getting an adequate supply of material.

Reports for the first ten days of this month indicate that the output of the automobile industry as a whole has increased in volume over the similar period in March. Last month, however, was slow in getting under way and made gradual gains in production as it progressed.

Should April output reach the 350,000 mark, as is estimated from the pace now being maintained, it would exceed all early predictions and prove one of the surprises of a year marked by exceptionally high monthly records. It would usher in a quarter that, if it maintains production at the same pace, would establish a record far ahead of the 862,872 cars and trucks produced in the first three months of this year.

Ford's operations are now definitely placed on a 6000 car a day basis with output, as a rule, running above that figure. Orders are behind with this company, as with other major car manufacturers.

The maintenance of high schedules is warranted by sustained demand in the field where cars have been selling well and by an expansion of sales efforts in sections that have been waiting for better seasonal conditions before entering the market. The south continues to be encouragingly productive in the number of buyers and the interest throughout agricultural districts in the west is steadily on the increase. Improved conditions with the farmer have brightened his outlook and made him an active and important factor in the distribution of automotive products.

This refers to trucks and tractors as well as to cars, and as the sale of these products increases, allied branches in the industry are benefitted. Parts makers are operating at a high mark, with no curtailment in orders sighted that would point to a let-up in the production of cars and trucks for several months, at least. Tire builders are showing steady improvement in manufacturing schedules and, in instances, are establishing new daily records.

Exports continue to gain except in portions of Europe where conditions are still unsettled and necessarily place limits on purchases. The northern countries are good buyers and there is a further upward trend in purchasing in South American countries.

Willys-Overland to Ask Bond Issue Authorization of Owners

TOLEDO, April 23—Stockholders of the Willys-Overland Co. will be asked to authorize an issue of \$15,000,000 of first mortgage bonds bearing interest not to exceed 7 per cent at the annual meeting to be held here May 8, according to notices placed in the mails today by Secretary L. A. Miller.

The bond proceeds will be used to pay off the bank indebtedness now reduced to \$10,000,000 out of notes in December and provide additional working capital. It is understood that the refinancing plan would enable the company to begin payment of back dividends on preferred stock.

The creation of the office of chairman of the board and definition of duties will also be an amendment of the code of regulations considered. Enlargement of powers of the board of directors will also be asked.

OLDS PRICES NOT RAISED

LANSING, Mich., April 19—G. H. Peasley, general sales manager of the Olds Motor Works of Lansing, denied reports now in circulation that any increase in prices of Oldsmobile cars had been made.

During the last few days, Peasley said, "unfounded rumors have been printed in many sections of the country, stating that a price increase had been made in the four and eight cylinder open models." This, he says, is an absolute untruth and no such announcement has been sponsored by his company.

NEW ACE PRICES

NEWARK, O., April 24—The American Motor Truck Co., manufacturer of Ace trucks, has increased the prices on its three models from \$200 to \$400. The prices printed in MOTOR AGE last week should have read:

	Old Price	New Price
Model 30, 1½-ton.....	\$2,400	\$2,600
Model 40, 2-2½-ton.....	2,850	3,250
Model 60, 3-ton.....	3,400	3,800

HUPMOBILE GOES UP

DETROIT, April 23—The Hupp Motor Car Co. has increased its prices from \$50 to \$75 on all its models. The new prices are as follows:

Chassis	\$1,035
Touring and roadster.....	1,165
Special roadster	1,265
Two-passenger coupe	1,445
Four-passenger coupe	1,595
Five-passenger sedan	1,750

Duesenberg Given Clean Bill of Health by Judge Leathers

Court Says Charges of Mismanagement Are Unfounded; Experiment Stage Passed

INDIANAPOLIS, April 21—Superior Judge James M. Leathers last night denied appointment of a receiver for Duesenberg Automobile & Motors Co., petitioned for by a lone stockholder, Peter A. Pfisterer. The case consumed three days given over to a court audit of books and corporate minutes of the concern since its inception, and taking of testimony from company officials and others, all of which failed to substantiate any charges made against the concern.

In announcing his decision, Judge Leathers said: "Pfisterer's charges of mismanagement, dissension, extravagance and insolvency are unfounded. His allegations are not proved by the evidence. I can see nothing to justify the charges. The company, after a slump in the industry and consequent delay in starting active operations, and subsequent period of development of its motor and car has unquestionably succeeded in developing a motor of national reputation and an invaluable asset. It would be foolhardy to shatter this industry which has successfully passed a period of development and experiment, and is now entering the stage of profitable production."

The plaintiff admitted on the witness stand that he had no figures or other authentic foundation to substantiate his charges. His information as to alleged company conditions was supplied, he said, by a confidential source. He refused to give names and admitted to swearing to the complaint and charges with nothing to support them or his oath except hearsay evidence.

Syndicate Withdraws Offer to National Motors Corp.

NEW YORK, April 21—Announcement is made that the syndicate which offered \$3,000,000 National Motors Corp. first mortgage bonds for subscription has withdrawn the offering and that the National corporation is making other arrangements to take care of its financial requirements. An executive of the National corporation states that the new scheme which is being considered calls for more money than the original offering which has been withdrawn and that a statement as to its character will be forthcoming next week.

VELIE PRICES UP

MOLINE, Ill., April 24—The Velie Motors Corp. have raised the price of two of their enclosed models, \$100. The sedan and brougham which formerly listed at \$1,795 are now \$1,895.

Sales Keep Apace of Record Output

Spring Breezes Blow Good for Milwaukee Retail Sales

Shortage of Cars Is Looked for About May 1 or 15; Trucks Go Well

MILWAUKEE, Wis., April 23—A week of fine spring weather following another belated snowstorm served to put passenger car trade into the most active condition known since early last June, and all records for sales are going by the board among established dealers handling cars in practically every price classification. Warehouse stocks accumulated are virtually depleted by deliveries on old orders and the rush of new bookings. Fear is expressed that by May 1 or 15 it will be a scramble to get enough cars, for a big demand is on.

It is rather surprising that the call for enclosed types is as strong as ever and actually increasing. It was believed that when spring arrived there would be a switch and the preponderance of demand be in favor of phaeton and roadster types. The Hudson-Essex dealer in Milwaukee reports that 75 per cent of all current sales are in the enclosed models, principally the coaches, with the remaining 25 per cent open cars. This ratio is rather high compared with other dealers' reports but it is significant.

Motor truck dealers are experiencing the best call for the heavy-duty types that they have known since early in 1920. Highway and general building construction is absorbing large numbers. Passenger bus business is excellent, yet it is believed that only the surface has been scratched along these lines. The majority of sales involve body types so far from standard designs that it is getting to be a big problem to make deliveries of the complete vehicle promptly.

There is not much private or public comment respecting prices, but what there is of it invariably turns to the thought that advances are not far off, especially in view of further wage raises announced locally and elsewhere and the publicity given to the upward trend in iron, steel, lumber and textile lines.

Increase of 75 Per Cent Is Reported for 1923 Sales

MILWAUKEE, Wis., April 24—An increase of 75 per cent over 1922 retail sales is the estimate upon which Milwaukee dealers are working as the result of a survey made by Bart J. Ruddle, executive secretary of the Milwaukee Automotive Dealers' Association, of trade between January 1 and April 16. On this basis Milwaukee dealers expect to retail 12,000 cars in 1923, compared with 7,000 in 1922. The gross sales in dollars in 1922 amounted to \$5,760,000. Averaging the cost of a new car at \$640, the

estimated value of 1923 has been at \$7,680,000.

The survey reveals that one dealer reported an increase of 300 per cent so far this year, compared with the corresponding period in 1922. Another reported a 100 per cent increase; a third, 91 per cent; a fourth, 70 per cent, and the remaining dealers reported gains from 50 per cent down, all, however, showing some increase.

So far as the state of Wisconsin is concerned, Secretary Ruddle estimates that between 60,000 and 65,000 cars will be sold in 1923. State sales in 1922 were 46,000, according to best available estimates made from motor registration figures.

Statements by Milwaukee dealers on current business show that sales so far in 1923 far exceed expectations in view of the unusually late and severe spring season. Following are typical reports:

Ford—Deliveries to Milwaukee dealers, January 1 to April 10, 2366, against 1,656 in 1922, an increase of 70 per cent.

Chevrolet—City sales, 1,168, against 363 in 1922.

Nash—City sales, 346, a gain of 91 per cent.

Dodge Bros.—Increase 30 per cent over 1922.

Buick—Increase of 105 per cent.

Cadillac—Increase of 20 per cent.

All dealers estimate that gains for all of 1923 will be higher than those for the first three months, as the most active selling period has only just set in.

TEXAS BUSINESS GOOD

HOUSTON, Texas, April 21—Automotive business in Texas for the first half of April was normal. Actual retail automobile and truck sales in Houston, Galveston, Orange, Port Arthur, Corpus Christi and San Antonio were just a little less than they were for the same period of March when business was the best of the year. The tire and accessory business was improving and the garage men were working over time putting cars into shape for heavy wear.

Waco, Temple, Tyler, Hillsboro, Cleburne, Brownwood, San Angelo, Ballinger, Abilene, Sweetwater, Lubbock and Plainview retailers said car sales were holding up, thought most of the business was on a trade-in basis. Mexia, Corsicana, Kosse, Goose Creek, Beaumont, Homble and Wichita Falls, all oil towns, reported business as good as it had been this year. Fort Worth and Dallas automobile dealers reported sales and deliveries a little lighter than for the same period in March. Accessory and tire business was improving and the outlook was encouraging.

JORDAN ON C. OF C.

CLEVELAND, O., April 23—Edward S. Jordan, president of the Jordan Motor Car Company, has been elected a Vice-President and Director of the Cleveland Chamber of Commerce.

Healthy Increase in Sales Is Reported by Atlanta Men

Farm Implements, Tractors, Trucks and Passenger Cars All Sell Well

ATLANTA, Ga., April 27—There has been a healthy increase in automotive sales among the Atlanta dealers and distributors the past five or six weeks, with a majority of dealers reporting sales on a par with the peak period of 1920, and in many cases even in greater volume. As a whole dealers are very optimistic over the 1923 outlook, and believe it will prove the largest year in sales volume the industry has ever experienced in this district. Automotive registration figures at the State Vehicle Department indicate a healthy upward trend among dealers over the entire state, with many more licenses sold at this time than the same period in 1922. The last report of the Federal Reserve Bank issued this month covering conditions in the sixth district, which comprises the southeastern group of states, shows a still further betterment in financial conditions. Buying power of southeastern farmers is now at the highest point it has ever been due to continued high cotton prices.

Sales of farm implements by the largest distributors in the district, including principally tractors, was 38.4 per cent better in February, 1923, than the same month in 1922; as compared with January this year, February sales were 24.7 per cent greater. Definite figures for March are not yet available, but indications the latter part of the month promised an increase over February of 35 to 40 per cent.

Chicago Sales Receive Aid From Spring's First Trip

CHICAGO, April 20—Fine weather here has brought out many vehicles of every description—most of them able to get as far as the nearest automobile dealer where a new car was purchased. Sales have gone far ahead of expectations because of the unexpected rising of the mercury within the last two or three days. Dealers in the low and middle priced car fields are, to a large extent, dropping farther behind on deliveries.

Outlying dealers report more and more sales coming their way and this, it is pointed out, is because these dealers have enlarged their service facilities and are prepared to give the same service as their main stores on the row. While most of the cars sold are sold to owners of older models on trade, there are still a good number of sales to people who are "first time" owners.

Tractor Meeting at Chicago Is Surprise; Over 100 Attend

S. A. E. Program Includes Bradford of the American Farm Bureau

CHICAGO, April 21—The tractor meeting held here today by the Society of Automotive Engineers was the biggest surprise of anything that has happened in tractor circles for a long time. The attendance ran more than 100 and the entire assembly remained on the ninth floor of the Auditorium Hotel for the entire session. The number at lunch ran much beyond expectations and reservations.

The program was entirely of an engineering interest, except the luncheon talk by President Bradford of the American Farm Bureau, who was introduced as a farmer, the third generation of farmers in the same community in Ohio. Bradford said that the farmer of today wanted a tractor somewhat comparable to the automobile. A tractor that was somewhat standardized in appearance and arrangement, one that would give as little worry as an automobile in its ability to do the work, and was "get-at-able." He said that today there was no worry on the part of the farmer when he started some place in his automobile, but if there was a tractor that could be started in a 20 acre field without misgivings, it had not reached his locality in Ohio.

In the morning session Prof. S. O. Sjogren of the University of Nebraska read a paper in which he described the tests made under the Nebraska law governing the sale of tractors in that state. He gave the following conclusions:

	1920	1921	1922
Per cent of those completing tests and fulfilling all original claims	15.4	40.0	80.0
Per cent of those completing tests which could not develop power claimed under original specifications	41.5	26.7	20.0
Average increase of fuel economy of kerosene tractors (using 4-Cyl. vertical motors) tested in 1922 over machines of same class tested in 1920		29.2	

The afternoon session was given over to C. M. Eason, of the General Motors Corp., who had prepared a paper on the General Purpose Tractor. This paper he filed with the S.A.E. and his talk before the engineers assembled consisted of showing more than 100 pictures of tractors, ranging from the early day steam tractor to the latest motor cultivator. Eason did not express an opinion as to which type was to survive but his pictures led to the conclusion that the automotive type plowing tractor was surely pushing all other designs aside for that particular field and that the Toro and Parrett type cultivators were making progress as general purpose farm tractors.

Friday following the S.A.E. meeting the Tractor and Thresher Department of the National Association of Farm Implement Manufacturers held a session in the same hotel. Eason was a speaker at this session also and he here stated the conclusion that there would be a limited production of a greatly improved plowing machine but that the great tractor production of the future would be a general purpose tractor of less horsepower than tractors of today and a tractor that would be used almost every working day. Cultivating, he said, was a much greater job than plowing.

At this session Guy Hall presented a plea for further assistance from the advertising departments of the farm implement factories so that he would be able to prepare proper illustrated articles for the farm and business press interested in these products. His newspaper publicity has been successful but he has not had material for more intimate articles.

Hall was also instructed to draft plans for the "Power Farming Day" at the various state fairs.

The feature of the afternoon program was a talk by Alex Legge, president of the International Harvester Co. who warned all concerned in the farm implement business to beware of undertaking too great responsibilities on the high material and labor markets and to be careful of building up a production on the basis of duplicated prospects. He said that one possible buyer of a tractor can easily be counted ten times while he is looking about among the dealers within the range of a day's travel in his flivver.

CARDWAY WITH HAYNES

KOKOMO, Ind., April 24—Col. Fred Cardway, formerly vice-president and general manager of Packard Motors Export Corp., and internationally known in automotive export trade, has been appointed director of exports for The Haynes Automobile Co. with offices at 342 Madison Avenue, New York City, according to an announcement by Alton G. Seiberling, vice-president and general manager of The Haynes Automobile Co.

TWO DALLAS SHOW DATES

DALLAS, Tex., April 21—The Dallas Automotive Trades Association will hold its annual fall show this year, Oct. 13 to 18. It will be held in connection with the State Fair of Texas & Southwest Exposition. Another show date announced by the Dallas association is the 1924 spring show, scheduled for February 11 to 17.

Curtain

INDIANAPOLIS, April 23—Exit, "Dolly Dimples," enter, Tin Lizzie. The most ancient burlesque house of the city is being remodeled into a five-story storage garage. Recent parking ordinances that eliminate angle-parking in the downtown section have made garage space in great demand, and this ancient home of the Girlie-Girlie show, within 200 yards of the Circle, becomes a refuge for the cars driven from the curb.

Maxwell-Chalmers Rings Up Over \$1,000,000 for 1923

First Quarter Business Indicates That Prediction of 74,000 Cars Will Materialize

DETROIT, April 24—Maxwell-Chalmers made over \$1,028,000 for the first quarter of 1923. The history of the re-establishment of the reputation and good will of the Maxwell product is contained in a report of Chairman Chrysler to the stockholders, as presented here yesterday.

More than \$6,000,000 worth of Maxwell and Chalmers were sold during 1922, representing a total of 48,833 Maxwells and 5978 Chalmers. This was nearly 5000 more cars than predicted at the beginning of the year.

During the year, the dealer organization was rebuilt and at the present time the corporation has more orders on its books than it can produce. The Maxwell Motors, Ltd., of London, on Jan. 1, 1922, had in stock more than 1000 passenger cars and trucks left from the old company. This inventory now has been completely liquidated and the company can show a substantial profit on its 1923 business.

Net profits for the year 1922 from the Maxwell unit amounted to over \$2,018,000, or equivalent to more than \$11 per share on the A stock.

Pending the readjustment and the receivership of the Chalmers company, the loss for the year from Chalmers operations was \$1,186,603. The consolidated net profit amounted to \$831,661, of which \$720,714 was carried to Class B stock equity account.

Chairman Chrysler reviewed the history of the acquisition of the Chalmers physical assets during the year and it is anticipated that this unit will show a profit from this year's operation.

The Maxwell Motor Corp. is at present in a very strong position, with no bank loans. The manufacturing plants, according to Chrysler, have sufficient capacities to produce quantities as scheduled at low cost cash, and sight drafts have increased from \$4,449,220 on Jan. 1, 1923, to approximately \$6,000,000 at present notwithstanding the larger volume of materials in process of manufacture. The ratio of current assets and current liabilities on Dec. 31, 1922, was approximately three and a half to one. Over \$8,000,000 in funded debt was retired during the year.

Plans for 1923 are based on a sale of 60,000 Maxwell and 14,000 Chalmers cars. Net earnings of the corporation for the first quarter of 1923 approximate \$26,000 compared with the loss during the corresponding period of \$611,400.

TO TEACH SAFETY

CHICAGO, April 25—The new Chief of Chicago's Police, Morgan Collins, has asked the teachers of Chicago's public schools to make the teaching of safety, a part of their daily duties.

"Better Motor Trucks," Says Day, G. M. C. President

Legislation to Make Engineers More Exacting With Future Models

PONTIAC, Mich., April 25—Better motor trucks will result from the wave of legislative action now being discussed by various state legislatures, according to W. L. Day, president and general manager of the General Motors Truck company of Pontiac, Michigan.

The motor trucks of today, Day says, are so far superior to those of a decade ago that there can be no comparison, but, he believes, the progress is going to continue and within the next few years the people will see vastly different types than those now in use.

"Many legislatures are discussing laws to govern trucks," Day says, "Some of these laws embody gasoline taxes, others weight taxes and others just plain, ordinary bills which seek to curb the motor truck's growth."

"Contrary to general belief, the truck manufacturer welcomes fair laws. They will have two effects. First, they will increase the state revenues which in turn will increase the good roads, while the roads will make the sale of motor trucks much easier."

"Secondly, they will stimulate engineers to reduce the weight of trucks and to so construct the motors that they will give greater mileage than they do now. This means better transportation, at less cost, and this, in turn, means more sales for the truck manufacturer."

"It is a proven fact that the sales of motor trucks will increase in exact proportion to the economy with which they can be operated for the average business man will only buy when it can be shown that the truck can save him money, over the older methods of transportation."

QUINLAN HAS FINANCE COMPANY

CHICAGO, April 24—A security company to finance wholesale and retail automobile sales has been organized by the Quinlan Motors Co., Moon distributor in Chicago and surrounding territory. The company is known as the Quinlan Securities Co. and is incorporated in Delaware for \$520,000, the stock being 20,000 shares of preferred at \$25 and 20,000 shares of common at \$1.

The company is a co-operative concern for Quinlan dealers by whom the stock is owned. Its facilities will be available to Quinlan dealers to finance the sale of Moon cars to their customers, on the time payment plan. It is similar to the Dealers Sales Corporation, the cooperative retail store on Michigan avenue owned by community Moon dealers. The Dealers' Sales Corporation in eight months of operation has accumulated a surplus of 100 per cent of its capital stock and has paid quarterly dividends of 7½ per cent, or at the rate of 30 per cent a year.

VOORHIS ELECTED PRESIDENT

NEW YORK, April 21—D. W. Voorhis, Brooklyn manager of the Hudson Motor Car Co., has been elected president of the Brooklyn Motor Vehicle Dealers' Association, succeeding A. D. Corwin. Joseph Haas is the new first vice-president; H. H. Donaldson, second vice-president; L. C. Brown, treasurer and C. A. Rodgers secretary. New members of the board are D. W. Voorhis, C. A. Rodgers, C. M. Bishop, I. C. Kirkham, E. L. Franklin and F. D. Wait.

Virginia Assembly Passes Gas Tax Bill; Other Laws

RICHMOND, Va., April 23—Virginia General Assembly in its closing sessions here passed a three cent gasoline tax law effective July 1 on all motor driven vehicles with the exception of tractors. The matter of a bond issue for good roads was referred to the people of the State for a vote, in November election.

The Assembly adopted legislation fixing the penalty for driving an automobile while drunk at withdrawal of license for one year.

Following the sessions Russell H. Rawlings, secretary of the Virginia Automobile Dealers' Association, said that the gas tax law would be attacked as unconstitutional when it becomes effective.

MAXWELL ADDS SEDAN

DETROIT, April 20—Maxwell Motor Corp. has added a new sedan on standard chassis to its line, differing from the regular model by the addition of many items of special equipment and special finish, and priced at \$1,625 at Detroit. The principal features are a rear trunk, two bar luggage rail on the roof with wood slats to protect the roof fabric, and spare tire carrier at the front. The car is finished in a new shade of gray-green with emerald green trim at the windows and an emerald stripe about the body below the belt. Metal trim is in nickel. Interior upholstery is of gray-green mohair with moldings and fittings in walnut.

NEW WESTCOTT SEDAN

SPRINGFIELD, Ohio, April 24—A new sedan model has been added to the Westcott line, the lines of the brougham being closely followed. A new type of windshield has been fitted, this having a solid upper panel and a framework integral with the body. The lower half is adjustable by a lever working over a quadrant. Two spare tires are carried on the sides and a touring trunk on the rear.

JORDAN'S NEW BROUGHAM

CLEVELAND, April 24—A new four door brougham has just been started in production by Jordan and will sell for \$2285. The lines of the body are long, low and well rounded to get away as far as possible from sharp corners. The doors swing wide and the cushions have a comfortable tilt. The upholstery is in broadcloth and the interior fittings in platinum finish. A trunk containing two suitcases is built on the rear.

March Production Highest on Record, Says Census Bureau

318,424 is Given as March Figure; Comparative Table Issued

WASHINGTON, D. C., April 23—Automobile production increased in March and was the highest on record, exceeding by 64,006 cars and trucks the high production of last June, according to reports received by the Department of Commerce through the Bureau of the Census, in cooperation with the National Automobile Chamber of Commerce. Output of passenger cars increased from 254,650 in February, to 318,424 in March, and truck production increased from 21,815 in February to 34,593.

The following table gives the total production for each of the last nine months, with the corresponding figures for the same months of the previous year. With few exceptions, the reports each month are from identical firms and include approximately 90 passenger-car and 80 truck manufacturers.

	Passenger Cars		Trucks	
	1922	1921	1922	1921
July	224,770	165,574	*21,837	10,766
Aug.	*248,122	167,705	*24,467	13,080
Sept.	*187,661	144,669	*19,188	13,648
Oct.	216,099	134,734	21,512	12,813
Nov.	*215,284	106,042	21,603	10,010
Dec.	*207,269	70,690	20,050	8,307
	1923	1922	1923	1922
Jan.	223,706	81,693	*19,377	9,416
Feb.	*254,650	109,171	*21,815	13,195
March	318,424	152,959	34,593	19,761

*Revised.

NASH ADDITIONS COMPLETED

KENOSHA, Wis., April 24—Additions to the Nash four cylinder car plant in Milwaukee and to the main plant of the Seaman Body Corporation of Milwaukee, one-half interest in which is held by Nash Motors, have been completed. These facilities have made possible increased production of Nash four cylinder cars and Nash enclosed cars.

March, the biggest month in point of sales in the history of The Nash Motors Company, established many new sales records for Nash distributors and dealers throughout the country. One of the records established was that of The Reeke Nash Motors Company of Cleveland, Ohio. In the last week of March the Reeke Nash company delivered more Nash cars at retail than were ever delivered in any month in the history of the Nash business in Cleveland.

SALES IN KENTUCKY

LOUISVILLE, Ky., April 25—Sales of new automobiles in Jefferson County for the first quarter of 1923 amounted to 2,027 according to a tabulation made by the Louisville Automobile Dealers' Association. This is far in excess of the sales for the corresponding period of any previous year and is more than one-third of the sales of the entire year of 1922.

Strattan, Monroe Maker Gets Under Way on New Car Staff

Minor Changes on Monroe Car and Price Field of New Strattan

INDIANAPOLIS, April 21—The Strattan Motors Corp., which now manufactures the Monroe and is to produce the Strattan shortly, is rapidly completing its organization staff and planning for considerable expansion of its distributing force and organization. A corps of district representatives is being built up and the company expects ultimately to have at least twenty men in the field supervising sales work under the leadership of President Frank S. Strattan, who will handle all sales affairs.

Frederic R. Barrows, vice-president, will virtually act as controller, with Frank E. Kateley, the secretary-treasurer, as manager and Col. Charles F. Warfel, purchasing agent and traffic manager. Berley K. Orr is auditor. Both Strattan and Kateley, formerly of Cleveland, Ohio, have taken up permanent residence in Indianapolis.

Except for minor changes in equipment and fittings, the Monroe is being continued as it was when taken over by the company. A new type of starter of the same make as formerly used is being employed, as are other refined types of equipment and fittings that continue in general design but with such improvements as are available at this time. Additional color options are to be provided for Monroe cars which formerly were restricted in this particular. Improved headlights and the other minor refinements such as tire carriers of a new type are being provided.

The company believes that the Monroe touring at \$965, with the sedan at \$1465 and the coach job, which is expected to be ready shortly, at about \$1095, will prove an attractive line in connection with the Strattan touring car, which will list at \$695 with the sedan at \$995. Production of Strattan is expected to begin about mid-June, even if the early assembly has to be conducted in temporary quarters. The concern is not yet ready to announce its plans regarding the plant it will purchase for the Strattan, but it is understood that several locations in Indianapolis are under advisement.

Herbert F. Johnston Is Made Receiver for Mitchell Co.

CHICAGO, April 19—It was announced here today that Herbert F. Johnston, president of S. C. Johnston & Sons, paint manufacturers of Racine, Wis., was appointed receiver for the Mitchell Motors Co. of Racine by Federal Judge Ferdinand A. Geiger at Milwaukee late last night. This action followed the filing of an involuntary petition in bankruptcy by three creditors and was taken after all efforts toward financial rehabilitation of the company by a stockholders' and cred-

itors' committee had failed. The liabilities are approximately four million one hundred thousand dollars, with estimated quick assets of about one million dollars and other assets estimated at three million dollars, the major part of the assets being automobiles and parts of more or less speculative value.

Confirmation of the appointment of the receiver was made public here today by Benjamin V. Becker of Levinson, Becker, Schwartz & Frank, the attorneys who have represented the stockholders' and creditors' committee comprising about 95 per cent of all the creditors.

"The appointment of the receiver was necessitated," said Becker, "after all negotiations with prospective purchasers and investors had failed to materialize. The Mitchell company has a fine car and the committee devoted a great deal of time and attention in the effort to put the company on its feet again. While the committee was engaged in this work, some of the creditors brought suit in Wisconsin, and also litigation was threatened in New York, which precipitated the receivership. The property will now be taken charge of by the federal court."

We're Baffled and Beaten But—

CHICAGO, April 21—The advertising department of MOTOR AGE put over a news scoop on the editorial department in last week's number of this magazine, only they failed to tell the whole story.

This news beat was printed on pages 74 and 75. The advertisement announces a new car to be priced at \$750 at the factory, but it does not name the factory—which we think from a news standpoint is very poor work. But this is an advertisement.

This advertisement has started many guessing pools. These are being participated in by every division in the automotive industry, from car manufacturers down to grease hounds and nearly every one is quite sure that he knows the answer.

According to the text of the advertisement the limits are the factories that will be reasonably expected to manufacture more than 100,000 cars this year. According to production statements gathered by the news department of MOTOR AGE such companies are Ford, Chevrolet, Oakland, Durant, Dodge, Buick and Studebaker. If other companies have the 100,000 ambition they have not yet announced it.

The News Editor is authorized by the Squeeks and Rattles Editor to announce that S. & R. is conducting a pool and the first to name the right car in this contest will receive a framed copy of the S. & R. Page announcing the winner. A free hand portrait of the winner will be printed with this announcement.

The second edition of this advertisement is running this week but the advertising manager still insists that he has a right to at least one secret.

New York State Organization of Dealers Is Now Completed

C. W. Bull of Syracuse Is Elected President of New Body

ALBANY, April 21—A New York State organization of automobile merchants was organized in this city this week with C. W. Bull of Syracuse as president. The organization follows several preliminary meetings held here within the last few months.

Following his election Bull stated that the purpose of the new organization was to take a constructive and cooperative stand in all questions effecting not only the dealer but motorists as well.

He said:—"The day has gone by, when either the dealer or the motorist can adopt an attitude merely of opposition to everything that affects them adversely, regardless of whether it is in the interest of the general public. What is good for the public at large is bound to be good for the automobilist. This applies not merely to regulatory measures, but also to taxation.

"In the matter of taxation, the principle which the association, along with automobile interests of all kinds, has pledged itself to, is that there shall be no special taxation on the automobile for anything except the maintenance of improved highways, and that under no circumstances shall such special taxation exceed in amount the sum necessary for such maintenance purposes each year.

"This applies not only to fees, but also to the proposed gasoline tax. The association has not taken any stand on the question of the gasoline tax, but it can be said without any formal action being necessary, that no automobilist, nor any automobile dealer, will favor singling the automobile out from other property, for the purpose of providing revenue for general purposes.

"The enactment of such a principle would be akin to passing a sales tax and limiting it to automobiles. This is manifestly unjust and improper, and the automobile interests of the state are steadfastly opposed to it."

Other officers elected are as follows: R. D. Dean, Binghamton, first vice-president; R. H. Baker, Buffalo, second vice-president; E. B. Jackson, New York, secretary-treasurer. Members of the board of governors are: W. W. Garra-brant, Utica; Walter F. C. Tichborne, Poughkeepsie, and H. A. Rayno, Albany.

GOODYEAR CLAIMS RECORD

AKRON, O., April 23—The world's tire production records were shattered on Friday, April 13, when the Akron, California and Canadian factories of the Goodyear Tire & Rubber Co., in 24 hours time turned out a total of 64,013 completed pneumatic automobile tires. Goodyear officials claim this is the largest number of tires ever produced by one factory organization in 24 hours in the world's history.

Torbenson, Perfection and Eaton Axle Co.s Consolidate

J. O. Eaton Will Head New Corporation to Be Known as Eaton Axle and Spring Co.

CLEVELAND, April 24—The long pending deal for the merging of the Torbensen Axle Co., the Eaton Axle Co., and the Perfection Spring and the Pontiac, Mich., Spring plant—a unit of Perfection Spring—has been accomplished. Bankers are working on financing plans and when they conclude, an \$8,000,000 corporation to be known as the Eaton Axle and Spring Co. will operate the properties. Conservative estimates place the annual business of this concern, the largest of its kind, at \$20,000,000. J. O. Eaton, formerly a co-receiver of Standard Parts Co., and well known in the automotive spring industry, will head the new corporation, and the same group of automotive experts who have been in charge of the various plants will remain on the staff.

Otis & Co., local investment bankers, today announced that Torbensen Axle of this city had purchased the plants of the other two concerns that figure in the merger. This was made known when it was announced that Torbensen Axle had asked its stockholders to authorize an increase in its capital stock for the purpose of taking over the other two plants.

Some time ago a syndicate headed by Howe, Snow & Bertlett, Inc., of Grand Rapids, purchased at receiver's sale, the Perfection, Eaton and Pontiac Springs plants and three service stations, one at Cleveland, another at Boston and a third in New York. The Eaton plant was purchased for \$1,125,000 and the Perfection Springs plant for \$1,025,000. Since then, four companies outside Cleveland interests had been bidding for the plants, but Torbensen was successful. The combined floor space of the three companies is 573,000 square feet.

The Torbensen plant in this city makes the Torbensen internal gear drive and supplies one-sixth of all track axles sold in the United States, exclusive of Fords. Eaton plant makes axles for passenger cars, and two years ago completed a modern and economical plant. One Perfection Springs plant is at East Sixty-fifth street and Central avenue, this city, and another is in Pontiac. Through the service stations and jobbers, it does a large replacement business. Cadillac, Peerless, Jordan, White Co., Ford, Jewett, Stearns, Maxwell, Chalmers, Winton, Republic, Wills St. Claire, Pierce-Arrow, International Harvester Co., Olds Motor Works, Commerce Motor Car Co and Velie Motors are among customers of the companies.

Gets Five Years for Selling Car He Had Not Paid For

WASHINGTON, April 24 — Justice Bailey, in the criminal court, sentenced William J. Fay to serve five years in

prison on a charge of grand larceny. He is alleged to have removed an automobile, purchased on the installment plan, from the L. R. Taylor Motor Co., from the district, and sold it before he finished paying for it. In addition to the five-year sentence, Fay must also serve a two-year sentence for passing a worthless check for \$75 in 1921.

Matthews Motors Co. Sales School Holds First Session

CINCINNATI, April 25—First session of a free school for salesmen was held recently by the Matthews Motors Company, Cincinnati distributors of the Overland & Willys Knight, with an attendance of nearly 50 young men.

The school, which was operated every evening for a week, was unique in that attendance was not confined to employees of the Matthews Motors Co., but an invitation to be present was extended to all persons interested, without any obligation on the students' part to become salesmen for this firm.

Lee Matthews, president, and William Rehtin, sales manager of the distributing firm, upon conceiving the idea of the school, took the matter up with the Overland factory and were promised assistance from some of the highest officials of that organization.

The school was formally opened with a short address by W. McPhail, Columbus, Ohio, distributor, followed by addresses of Rehtin; Paul Revelt, advertising manager of the Willys Overland Co., and Matthews. It is likely that weekly sessions of the school will be resumed from time to time.

CRAWFORD PRICES UP

HAGERSTOWN, Md., April 24—The Crawford Automobile Company have announced an advance in price of \$100 on the open models of Crawford cars, they will now list at \$3100. The Crawford sedan remains unchanged at \$4500. On the Dagmar sport models, a new price of \$4500 on the sedan has been announced, the former price of \$4250 was set before a regular production schedule was worked out. The open Dagmar models list at their original price of \$3500.

PARENTI IS SOLD

BUFFALO, N. Y., April 23—The Parenti Motor Car Company was sold April 12 in Federal Court to the Hanover company for \$225,000. Over \$2,000,000 is said to have been invested in the company, which was recently thrown into bankruptcy. The sale of the company was opposed in Federal court by Ralph S. Kent, counsel for the stockholders.

COMMERCIAL VEHICLE SHOW

DETROIT, April 25—Directors of the Motor Truck Industries have made definite plans for a dealer and user commercial vehicle show to be held at the Coliseum in Chicago during the first half of September. In addition to trucks there will be taxicabs, rail cars, trailers and all forms of motor transportation.

Peerless Rumors Unfounded, Says Broker; Chandler Good

Both Companies Going Ahead and Working Hard to Meet Demands

CLEVELAND, April 23—The Peerless and Chandler automobile companies of this city are producing cars at a rate that is much higher than in March. Recently, rumors were circulated in the local stock exchange regarding the condition of the Peerless company, which caused a committee of brokers to call on R. H. Collins, president of the company.

After the conference, E. M. Baker, who headed the brokers' committee, said: "We have frankly discussed the Peerless situation with Collins and, as a result, I am convinced that the many rumors floating around in reference to the company's affairs are absolutely without foundation. The business of the company is satisfactory in every respect."

March shipments of the Chandler are reported as being 20 per cent higher than January and February combined. Production is at the rate of 25,000 cars annually. Floor space has been expanded to increase the output.

Iowa Legislature Passes a Two-Cent Gas Tax Bill

DES MOINES, Ia., April 23—One of the bills passed in rush moments of the last days of the Iowa legislature was a gasoline tax bill. The bill, known as the Caldwell bill, provides for a state tax of 2 cents per gallon on all gasoline sold in Iowa. The bill has not yet been signed by the governor, but those in close touch with the state house are sure that the governor will approve the act. As soon as the governor has signed the bill and legal publication of the act has been completed, the law will be in effect.

The measure provides for a 2-cent tax on every gallon of gasoline used by Iowa automobile owners and is expected to produce an annual revenue of \$5,000,000. The revenue will be used for the construction of roads and will be divided as follows: One-third to the primary road system and two-thirds to the secondary road system with the added provision that in counties having cities of 9,000 or over, a portion of the tax money not needed on secondary roads may be expended on roads leading into the cities.

G. M. C. DIRECTORS ELECTED

WILMINGTON, Del., April 18—At the annual meeting of the stockholders of General Motors Corp., held here today, directors were re-elected for the ensuing year. To fill vacancies existing on the board, John L. Pratt, vice-president of General Motors in charge of the accessories companies, and DeWitt Page, president and general manager of New Departure Manufacturing Co., were elected directors.

Chicago's Sixth Annual Used Car Show Opens; Demand Good

Advance Showing of Cars Results in Sales and Prospect Lists; Outlook Excellent

CHICAGO, April 23 — The Chicago Automobile Trade Association's Sixth Annual Used Car Show opened Wednesday, April 25, at the Coliseum and will continue until May 5. The policy of the Chicago dealers regarding the sale of used cars at their annual exhibition is well known. This policy which requires that every car exhibited pass the test of an examining committee to determine its condition and value, is said by many to be responsible for the success of this annual event.

Thirty-two members are exhibiting. The show committee is headed by Harry P. Branstetter. An advance showing of the tested models in the showrooms of various dealers resulted in not a few sales and a goodly list of prospects. Branstetter as well as other members are firm in the belief that this year's show will be the greatest in point of attendance and sales yet held. Prices are lower than ever before and a showing of better cars is in evidence.

Used car demand in Chicago is very good now. In fact, from reports issuing from different sections of the city, it is doubtful whether the market has ever witnessed a demand equal to this spring's. One dealer who has been in business for nearly two years, and who, for the last eighteen months has always had at least one used car on his floor, now has moved his entire stock for the first time.

Dollar Gasoline "Gossip" Says Col. Robert Stewart

MILWAUKEE, Wis., April 23—All talk of "dollar gasoline" is the most preposterous and ridiculous gossip imaginable, according to statements made by Col. Robert W. Stewart of Chicago, chairman of the board of the Standard Oil Co. (Indiana) before a session of the Chamber of Commerce at LaCrosse, Wis., where a lengthy stop was made by a party of company officials making a tour by private car of the larger distributing points in the northwest. It was one of the first and most direct official statements that has yet been made in answer to the LaFollette prophecy, and it was made in the state of which the prophet is senior United States Senator.

Col. Stewart said he spoke only for the Indiana company, but his remarks were accepted as an enunciation affecting all members of the Standard group. He said in part: "In January I was a witness before the United States Senate committee of manufactures, which was investigating the alleged high price of gasoline; and I wish you to keep in mind that the principal complaint of the so-called independents has always been that the prices maintained by this cor-

poration were too low—not too high—the charge being that we maintained these low prices to drive our competitors out of business."

Jordan Sells His First Car in His Own Home Town

MILWAUKEE, Wis., April 23 — It takes a long time for the old home town to give recognition—a prophet is not without honor save in his own country a long time.

Edward S. ("Ned") Jordan has discovered this. The head of the Jordan Motor Car Co. of Cleveland was born in Merrill, Wis. He attended the public schools and in spare time and vacations set type and wrote items for the home paper. He went to Wisconsin university and was a reporter on Madison papers, then going to Milwaukee dailies. He advanced more and more and the old home town looked on, hardly appreciating the real effort and achievement in his career. Folks bought automobiles, but nary a Jordan was ever seen on Merrill streets, save those passing through.

A new chapter was written last week. Charles Aronson, Merrill dealer, sought a Jordan franchise and got it. Jordan left Merrill for the "big league" before Aronson established himself there in the business. Aronson dropped a personal note to the president, and he prizes as one of his most valuable possessions an intimate letter from the chief of the company whose product he now represents, who therein expresses great satisfaction and extreme pleasure that the old home town has a remembrance of him.

"GYPS" TO GO

CHICAGO, April 23 — The Chicago Garage Owners' Association, according to J. R. Emery, president, will soon go on record as having endorsed a plan recently placed before the board of directors which calls for the protection of the car owner. As explained by Emery, every garage owner who is a member of the association will be required to display a sign showing that he is a member.

Any "gymps" reported by car owners and found guilty of wilfully cheating motorists will be expelled from the organization. Emery also told of the association's fight for a four-cent margin on gasoline, of a plan whereby the coal for all the members will be bought by the association at a saving of about \$2 a ton. At a banquet recently, the members voted over 90 per cent as opposed to recognizing any union of garage workers.

CITROEN TELLS STORY

DETROIT, April 24 — Andre Citroen delivered his lecture on the crossing of the Sahara desert by motor car before 1100 members of the Detroit Section of the Society of Automotive Engineers and their guests here last night. Citroen is demonstrating his cars with the endless track attachment in a selected spot on the outskirts of Detroit today.

Owners Meeting at Dealer's Invitation Is Winning Idea

J. C. Dorman, Buick Agent, Gets Real Attendance at New Car Owners' Meetings

GARY, Ind., April 21—The Fifth Avenue Garage, Inc., has concluded the 1923 spring series of new owner meetings. This company sells Buick cars and for three years has held a series of meetings for owners just after the heavy rush of spring deliveries. It is possible that a fall meeting will be held this year. New Buick owners especially are invited to these meetings, although all Buick owners are welcome.

This year the meetings were held on Monday evenings with an average attendance of 100 despite some bad weather and some strong competitive meetings. One of the competitive meetings was a city council meeting at which the subject was reorganization necessary because of the recent bootleg convictions in Gary. The subjects of the meetings were:

- 1—The Buick car.
- 2—The owner's responsibility as to care.
- 3—Understanding of the battery and electrical system.
- 4—Courtesy of the road.

The speakers were (1) William Gruner, Buick branch, Chicago; (2) Eddie O'Donnell, Automotive Equipment Association; (3) A. H. Packer, MOTOR AGE, and F. B. Kennedy, Exide Battery; (4) Clyde Jennings, MOTOR AGE.

J. C. Dorman, manager of the Fifth Avenue Garage, says that these meetings have been a great help in cementing the friendly relations between the seller and the owner. He attributes the very high percentage of Buick owners that are customers of his maintenance and accessory departments to these meetings. Incidentally, Dorman says that he finds the after market of the car much more profitable than the sale of the vehicle. He has some Buick owners who seldom buy gasoline any place but at his pump.

Wilmer Resigns as Goodyear President to Head Board

AKRON, Ohio, April 23—George M. Stadlerman, vice-president of the Goodyear Tire & Rubber Co., was elected president by the directors today, succeeding E. G. Wilmer under the plan proposed by Wilmer and approved by the directors. Wilmer becomes chairman of both the board of directors and the executive committee and continues as president of the California and Canadian companies. He will carry full personal responsibility for the supervision and direction of the Goodyear management.

P. W. Litchfield, vice-president and factory manager, becomes first vice-president and Frank K. Espenhain, assistant to Wilmer, is made a vice-president also.

Wilmer will remove his offices to New York, May 1, and will locate permanently there.

Makes Advertising Make Friends for Him

ATLANTA, Ga., April 27—Taking quick advantage of the opportunities that come his way for advertising his business to the automobile public, is one of the things that has enabled Lon Credelle, an accessory dealer in Atlanta, to grow from a very small dealer to one of the largest dealers in the South within a short period of time.

Recently the Atlanta city council passed a new and important traffic ordinance. Credelle immediately obtained a copy of it, printed in booklet form, and put in for good measure some of the more important state and city traffic laws and a general road map of Georgia. He used the front and back pages for advertising and then distributed the booklet to thousands of automobile owners throughout the city.

Ford Truck Production Was 41,681 in First Quarter

DETROIT, April 22—Sales of Ford one-ton trucks in the first quarter of the year totaled 41,681, a new high quarter record. Sales of trucks in March alone were 18,717, which exceeded by more than a thousand, sales for the entire first quarter a year ago. The March total was 50 per cent higher than February. Sales to date conform with company predictions that the use of one-ton trucks will be greater this year than ever before.

Though the truck business is coming mostly from commercial centers there is a large increase in business from farming districts, and the company is looking for a continuing steady farm buying through the year.

Production of Ford cars and trucks for domestic use reached 37,793 for the week ending April 10, exceeding that of the previous week by 1,649. This sets a new record and is the first week when production was in excess of 6,000 completed cars and trucks every day. In this week the lowest day was 6,153 and the highest 6,406.

RUBBER PLANTS SOLD

CLEVELAND, April 24—Ashland men, headed by Charles D. Darrah, general manager of the Reliable Match Co., have bought at court sale the plant and assets of the Ashland Tire & Rubber Co., with the exception of cash on hand, notes and bills receivable. The upset price was \$125,000 and the Darrah bid was the only one received.

R. J. Shindler of Cleveland and associates have completed plans to purchase the Hubbell Tire & Rubber Co., formerly the Trumbull Tire & Rubber Co., of Newton Falls, O. The new company will be called the Newton Falls Rubber Co. Associated with Shindler are Irvin Jordan, A. C. Apple, W. W. Peters and J. A. Nichols. The company is capitalized for \$250,000 15 year 7 per cent first mortgage bonds and \$500,000 common stock.

Ford Weekly Purchase Plan Is Well Received Everywhere

Bank Co-operation Is Better in Some Sections and Salesmen Fall in Line Rapidly

NEW YORK, April 24—Reports from the sales department of the Ford Motor Co. are that the new weekly purchase plan is receiving a fine reception everywhere. Though there are no definite figures available on the number of persons opening specialized accounts, the movement is declared spreading rapidly, and will undoubtedly insure capacity operation of the plant for an indefinite period.

Some districts are reported taking to the plan more receptively than others, but this is accounted for entirely by individual dealer activity and measure of bank co-operation. In every section, however, the plan is declared achieving results, and like the formation of a snowball, is growing rapidly as the sales organization gets into the swing of the thing.

Bank co-operation ranges all the way from no co-operation at all in one or two scattered sections, the company reports, to a point where some banks have applied for displays of parts so these may be installed to keep the matter vividly before the public. The company will arrange to co-operate with the banks in every way and declares it expects that every city and town will soon have a regularly authorized place of deposit.

The plan has been hindered to some extent by the heavy business which all dealers are experiencing at this time, this requiring practically all their attention. Hundreds of applications for information on the plan received by the factory are being referred back to dealers in the territories from whence the letters come.

Details of the plan have been forwarded to all foreign branches and dealers with the suggestion that they make use of it according conditions warranted.

INDIANA GOOD ROADS

INDIANAPOLIS, April 24—Practically \$28,000,000 will be spent by Indiana during the next three years in constructing paved state roads with a total mileage of 958 miles, according to an announcement made by the Indiana Highway Commission. The 1923 program, because of limited funds, will include but 153 miles, while the 1924 and 1925 programs will average 400 miles a year.

LINCOLN AT 30 A DAY

DETROIT, April 23—Lincoln production is now reported at 30 cars daily. The addition to the Lincoln plant is being hurried to completion and will give opportunity for largely increased output. It is of the usual Ford type of construction, one story in height and measuring 1253 by 250 ft. It will house the entire machine shop of the plant.

Effects of Color On Salability of Car Discussed

CLEVELAND, April 23—The effect of color on the salability of an automobile was discussed at a meeting of the Automotive Engineering Society by Edwin Paton, of the local Franklin Motor Car Co.

Giving the result of a survey as to color preference, he said 64 per cent of those questioned preferred red, none preferred orange, and brown, blue, black and dark green were popular. He cited the distinctive painting of Yellow, Checker and Red Top taxicabs as illustrating the appeal of color.

He urged the engineers to put more time and study on the paint jobs, not only for the purpose of making the cars more attractive, but also to improve the utility of the paint.

Anderson Has Two New Body Models for Its 41 Chassis

ROCK HILL, S. C., April 23—Two new bodies have been added to the Model 41 Anderson chassis, these being the 41-E, five-passenger sport sedan, \$1745, and the 41-G, sport phaeton, \$1395. Both of these models have German silver radiator shells, disk wheels, extra tire and cover, a luggage trunk containing two suitcases on the rear, bumpers front and rear and aluminum rods on the rear of the body. The finish of the sedan is in gray and black, the chassis and running gear being black, the moldings and wheels being gray. The lower part of the body and hood are finished in gray and the upper part of the body in black. The phaeton is fitted with green upholstery and has a green body with black fenders. It is also equipped with windshield wings.

HOLD SALESMEN'S MEETINGS

DALLAS, Tex., April 21—The Dallas Automotive Trades Assn. has resumed its monthly salesmen's meetings. William Morris, president, said these meetings would not only be open to salesmen, but to heads of firms engaged in other lines of the trade, and he expected, by having these heads attend the meetings, to make it more interesting for the salesmen and the association generally. The first of these meetings was held in April with a large attendance.

BUSSES TO AID RAILWAY

LOUISVILLE, Ky., April 23—Motor bus lines as extensions of the Louisville & Interurban Railway Co.'s interurban lines radiating from Louisville will be established at an early date, it became known today. It developed that the company had negotiated with a motor truck company to supply the busses to be used for extending the service of the company to territories which heretofore have had only infrequent transportation accommodations to Louisville.

Bus Business to Benefit by Road Improvements in South

Great Strides Made Last Year to Be Outdone in 1923, Is Prediction

ATLANTA, GA., April 21—Due to the enormous amount of money that is to be invested in the various southern states this year in the construction of good roads and the maintenance and improvement of present roads, 1923 is expected to prove the biggest year in the history of the section in the development of the bus industry, according to automobile distributors here who are finding a market in the southeast for the motor-bus.

Last year some \$40,000,000 was added to the highway building and improvement funds in the district, and the outlook for the present year indicates a still greater period of activity, for practically all southern states are preparing to carry out even more extensive road programs than heretofore.

The bus transportation industry has experienced its principal development the past few months in Georgia and Florida, both these states now being interwoven by bus lines so that it is possible to reach almost every city and town of any consequence in that way. Whereas a year ago there were not more than two or three lines operating out of Atlanta there are now almost a dozen, covering the entire adjacent territory. These lines are doing an excellent business for the most part in both passenger and freight traffic, and existing companies since the first of the year have found it necessary to add busses to their systems.

In Florida the development of the industry the past year has been remarkable, and there have been at least 25 new companies formed in that city. It is now possible to travel throughout all of Florida by motorbus with the exception of the extreme southern part of the state, and this development has been made possible only by the construction of new roads. The same is true in Georgia.

In North Georgia the agricultural industry has advanced in less than two years from a comparatively unprofitable business to a highly successful industry, thanks almost entirely, farmers of that section state, to the construction of new roads and the development of the bus industry. The whole northern part of the state now is interwoven by bus systems and farmers are making everyday use of these line in the transportation of their products to nearby markets. At the same time merchants of the section advise that the industry has served to materially improve their business also, enabling the rural population to make trips at will to nearby buying centers.

The present year will witness the introduction in some of the southern states of proposed legislation that, if passed, will prove inimical to the welfare of the bus industry in the state in question.

In Georgia, for instance, an effort was made last year by the short line railroads to have the bus declared a public utility subject to the same rules and regulations as the railroads, but the Motorbus and Transportation Association of Georgia was at once organized and succeeded in defeating this law. The association still is active and is planning a further campaign this year, as it is practically certain the short line railroads will make a second effort to have this legislation passed.

Dealer Stages Sale to Show Salesmen How

BLOOMINGTON, Ill., April 19—To instruct salesmen in the qualities of salesmanship and emphasize the fact that persistency, ability, tact, and enthusiasm, if rightly directed, will result in the signature of a prospect to a contract, the Rue Motor Co. staged a clever demonstration in the assembly room of the Association of Commerce. A rural barber shop furnished the scene, the barber was the prospect, his wife was the second character in the drama, and the automobile salesman was the third. When the play opened, the barber was in the dumps. A patron to whom he had sold a bottle of hair invigorator for \$3 furiously demanded his money back.

He was in no mood, therefore, to be friendly to the salesman, but the latter refused to be discouraged. The objections raised by the prospect and also his wife, to the car, and the method of replying to them, furnished the exemplification of what constitutes success in salesmanship. Enough comedy was interjected into the performance to keep the audience in good humor, but the principal object of the demonstration was to show preparedness for every objection, to successfully answer arguments in relation to the advantages of competitive cars, without "knocking," and to stick to it until the contract was signed. The climax came when the signature was secured and the buyer and his wife became transformed from indifferent and captious critics, to eager car owners, insistent upon immediate delivery.

CAPITAL STOCKS REDUCED

EAST MOLINE, Ill., April 20—Capital stocks of the R. & V. Motor Co. and the Root and Vandervoort Engineering Co. have been reduced to comply substantially with the actual value of issued and outstanding stock. The reductions are merely an adjustment through which the corporations will reduce their annual franchise tax so that they will pay on the basis of actual stock in operation rather than on total amount authorized and much of which was never issued. The R. & V. stock is cut from \$6,500,000 to \$2,730,000 and the Root & Vandervoort, the holding corporation for R. & V. interests, from \$9,500,000 to \$2,400,000.

Clean Up Week Is Planned by Illinois Dealers' Assn.

Campaign to Cover Accessory, Tire, Automobile and Oiling Stations

PEORIA, Ill., April 24—Thirty-three affiliated local associations of the Illinois Automotive Trade Association will shortly take up a concerted series of discussions calculated to benefit the individual dealers as well as the public and industry as a whole. One topic is to be selected each month by F. C. Zihlman, secretary-manager, and he will ask each local body to devote considerable time to the subject assigned and then report back so that the results accomplished can be summarized. The first topic to be assigned will be that of clean and sanitary plants.

Every member will be asked at a certain date to be selected later and which will be known as "Clean Up Week," to renovate the premises and make it clean and inviting to patrons. It is believed that the public garages, sales agencies, repair shops, and accessory stores and supply stations can be made just as clean, neat, orderly and sanitary as the dry goods and clothing stores and other branches of trade.

It may not be possible to secure absolute cleanliness in the work shop, but it is argued there is no excuse for dirt, oil and other unsightly elements in the various departments to which the public has access. It is desired to impress upon employees the importance of cleanliness so that patrons will be given a favorable impression, rather than the contrary or go away with oil stained clothes, soiled by contact with some unsuspected dirty shelf or seat.

It is believed that the automotive industry has gotten into a rut in respect to slovenliness and unsavory surroundings at many of the plants in both city and country and that an energetic campaign, conducted by the Illinois association, will be productive of effective and beneficial results.

It is also believed that such a campaign, if rightly conducted, will spread and with the probable result of the dealers in all other states taking equal action, thus giving the movement a national significance and with welcome rehabilitation in proportion. The Illinois state association has been steadily increasing in membership and influence.

CADILLAC HAS PAPER

DETROIT, April 19—A publication known as the Cadillac Connecting Rod, issued in the interests of dealers and salesmen, has just made its appearance from the office of the Detroit Branch of the Cadillac Motor Car Co. It will be a monthly magazine issued the first Thursday in every month. The first issue deals with sales, advertising, new buildings and personnel. Its editor is R. V. Dixn.

CONCERNING MEN YOU KNOW

E. J. McMullen, of the sales department of the Olds Motor Works of Lansing, Mich., has returned from Casper, Wyo., where he spoke at the automobile show there. He reports that business is booming in the sheep and oil business.

R. M. Hatfield, service manager of the Olds Motor Works, Lansing, Mich., and Thomas O'Brien, assistant sales manager, are now holding a series of sales meetings throughout the southwest.

W. E. Martens has been appointed assistant general sales manager of the Traffic Truck Division of the National Motors Corporation in St. Louis. Martens has been with the company for about three years.

Gray F. Blackman, formerly with the M. D. Bryant company, has been engaged as general sales manager by W. O. Harlow, distributor of the Oakland line in southwestern Michigan.

C. M. Le Roux has been named general manager of the Atlanta branch of the Willys-Overland Co., succeeding F. S. Patterson, who recently resigned. Le Roux for the past eight years has been division and branch manager for the company in the northwestern states, with headquarters at Minneapolis.

Alex C. Pankratz has resigned as vice-president and works manager of the Werra Aluminum Co., Waukesha, Wis., and has organized the Quality Aluminum Castings Co., with \$150,000 capital. Contracts have been let for the erection and equipment of a new foundry, 60x200 ft., to be ready by May 15 or June 1. Associated with him in the enterprise are Frank Lemke and Percy Charlton, who until now were connected with the Werra company.

A. L. Herr, who until recently was general superintendent of the Jacques Mfg. Co., production body builders of Philadelphia, has joined the organization of the Charles Schutte Body Company at Lancaster to act in the same capacity.

George W. Kohl, for thirteen years connected with the Zinke Co. of Chicago, has resigned as vice-president and director and in all likelihood will engage in business for himself. As a Zinke official Kohl served mostly as western traveling representative and is widely known throughout the industry.

H. L. Bristow, who for a number of years has been advertising manager of the International Harvester Company in St. Louis, resigned April 1 to become secretary of the Mississippi Valley Implement Vehicle and Hardware Dealers' Assn., with offices at 211 North 7th street. The association has members in all parts of the Mississippi Valley.

James H. Byrne, who has been in the automobile business in St. Louis for about twenty years, has been appointed retail sales manager of the Weber Implement and Automobile Co., according to an announcement made by Albert Weber, general sales manager of the concern. The Weber Co. is distributor for Hupmobiles.

Etienne Planche, for the past nine years chief engineer of the Dort Motor Car Co., has resigned from that position to open general consulting offices in the General Motors Building, Detroit. Planche has been connected with the automotive industry from the earliest days and is widely known in the engineering field.

"Pay-as-You-Pave" Plan to Be Tried Out in California

George Heston Presents Plan for Paving Highways at Rate of \$25,000 a Mile

SAN DIEGO, Calif., April 24—The San Diego County Board of Supervisors has decided to give a three-year trial to a new plan for road-paving financing, as devised and presented by George Heston, treasurer of the county. The plan, in brief, is to build ten miles of road per year out of funds received from the automobile tax apportionment to the county, and from a slight increase—about 7½ cents on the \$100—in the direct tax rate. Under the bond issue method usually employed in the western states, including California, the total cost of a mile of paved highway, including construction, interest on bonds, expenses of bond election, and occasionally discounts, is rather more than \$50,000, the bonds usually being of 40-year duration. Under the Heston "pay-as-you-pave" plan, however, each mile of road is paid for as completed, and the cost per mile is approximately \$25,000, or rather less than half that of the cost under the bond issue method.

The people of San Diego county, in February of this year, devoted a road-building bond issue of \$600,000. There remains \$900,000 more of proposed county road work. This, according to agreement by the supervisors, will be done over a three-year period by using \$100,000 of motor tax money each year, or \$300,000 in all, and by raising the remaining \$600,000 by direct taxation. The Heston plan, which has been endorsed by most of the civic and commercial organizations and by many business men of San Diego city and county, calls for the paving of the roads at the rate of 10 miles a year without putting a burden on the people for the next 40 or 50 years through bond issues.

This plan also meets with the approval of motorists, and has been especially supported by the automobile dealers throughout the county, while automotive associations and dealers' organizations in other counties have had men here looking into the plan. Working in units of five years, the Heston plan would result in the completion of 50 miles of paid-for paved highway at the end of each such period, the cost per mile being approximately \$25,000, though it is generally estimated that this can be reduced to \$20,000 by the contracting for all 50 miles of the road at the beginning of one five-year period.

RECORD DAY FOR HAINES

SEATTLE, Wash., April 23—What the Fred S. Haines Co. considers a record for new car deliveries in one day was made here on March 31 when 159 new Chevrolets were turned over to purchasers.

Detroit Dealers Elect R. H. Williams President

DETROIT, April 19—New officers of the Detroit Automobile Dealers' Assn. are R. H. Williams, of Williams & Hastings, Inc., president; A. L. McCormick, manager of the Paige Sales & Service Co., vice-president; Walter J. Judd, of Miller-Judd Co., secretary, and Walter J. Bomb, of Bomb-Robinson Co., treasurer. Bomb and Guy O. Simons were elected to the board of directors, succeeding Harry R. Graham and H. W. Peters.



R. H. WILLIAMS

The by-laws of the association will be changed to create a group of associate members, which will include associate dealers of the regular dealer establishments. This membership will be of a special designation affiliating the associate with both the Detroit dealers' association and the Michigan State Automotive Association. As formerly, only the regular members will be entitled to vote on association matters and be privileged to exhibit at the local annual show.

H. H. Shuart will continue as general manager of the association and under his direction it is planned to widen the activities. The organization was shown to be in splendid financial condition.

COUNTY DEALERS ORGANIZE

ROCK ISLAND, Ill., April 23—The Rock Island County Trades Association of auto dealers and agents has been organized as a separate unit of the Tri-

city Auto Trades Association and will include in its membership dealers and agents of the county. T. B. Beatty, Quincy, vice president of the Quincy organization and prominent in state activities, discussed program of such an association and on his recommendation the bureau system was adopted. The new association plans semi-annual meetings with the Davenport branch of the Tri-city Trades Association and in this manner will keep in touch with matters of common interest while the two units will function separately in their fields.

DEALERS OPPOSE TRUCK LIMIT

WHEELING, W. Va., April 21—The West Virginia Automobile Dealers' Assn. at a convention held here went on record as opposed to the bill pending before the state legislature which limits the capacity of trucks on the roads of the state to 10,500 lbs.

President Helmick delivered an address on "Our State Association," in which he recited the progress the association has made since its organization, and predicted it would fulfill the fondest hopes of its members in its efforts to remedy the problems of the industry.

I. B. Bush, of Charleston, secretary of the Charleston dealers' association, made a plea for cooperation among the members. Among the speakers was R. C. Duffus, secretary of the Pennsylvania dealers' association.

COLE MAKING 100 A WEEK

INDIANAPOLIS, April 20—Production of 100 Cole cars a week during April is the schedule on which the Cole Motor Car Co. is working. This, according to a factory announcement, is an increase of 65 per cent over the March production. Appointment of 33 new dealers by the factory during March is reported.

IN THE RETAIL FIELD

The Battery Shop, 420 West Main street, Kalamazoo, has been named as general agent and service station for the American Bosch Ignition Co.

C. J. Mullikin, president of the Mullikin-Kincaid Motor Co. of Champaign, Ill., has sold his interest to A. S. Marlow of Chicago, who was formerly of the Fries-Malitz Motor Co., Ford distributors of the metropolis. F. B. Hamill also retires from the former company as director and has been succeeded by C. W. Newman of Urbana, Ill. The company will be known hereafter as the Marlow-Kincaid Motor, with A. S. Marlow as president; C. W. Newman, vice-president, and W. C. Kincaid, secretary-treasurer.

E. D. Valentine, proprietor of the Valentine Tire Store at Springfield, O., has become distributor in Clark and Champaign counties for the Chandler Motor Car Co. of Cleveland.

Ben G. Garver is a new Oakland dealer in West Columbia street, Springfield, O. He also sells the Franklin car.

J. B. Hamilton has sold the Hamilton Tire Co. of Aurora, Neb., to Floyd Harter and E. Nelson.

W. H. Robertson of Dalton, Neb., and E. M. Canfield of Colorado Springs, Colo., have purchased the Broadwater Motor Co. of Broadwater, Neb., and will take immediate charge.

Guy W. Grofton, Chadron Garage at Chadron, Neb., has taken the agency for the Studebaker in that territory.

The W. D. Rumer garage at Alliance, Neb., has been totally destroyed by fire. The loss has been estimated at \$60,000. Insurance on contents and building amounted to \$55,871. Among destroyed material were 16 used and new cars.

The Garage of Huntley and Baker, at Wadsworth, N. C., was destroyed by fire. There were about 20 automobiles in the shop, besides equipment and stock and the loss is estimated at about \$50,000.

The Keystone Tire Sales Co. of Greenville, S. C., has bought the Keystone Tire Sales Company's store in Savannah, Ga. M. N. Davidson, president of the Keystone chain, has left Greenville to take charge of the Savannah store. L. M. Davidson and R. R. Bishop will continue to operate the Greenville store.

J. H. Ham, Packard and Oakland distributor at Charlotte, N. C., has moved his automobile business into the building at 7 West Seventh street, formerly occupied by O. L. Barringer as a sales station. Barringer, a pioneer in the automobile business, has retired from the sales end of the business and from any direct connection with the automobile business, but is financially interested in a new company, the Auto Parts and Salvage Co., at 306 North Graham street.

The Cleveland Bumper Co. of Cleveland has been chartered with an authorized capital of \$10,000 to manufacture, sell and deal in bumpers, accessories and appliances by Carl F. Shuler and others.

The Superior Motor Coach Body Co. of Lima, Ohio, has been incorporated by W. L. Parmenter and others, with a capital of \$100,000, to manufacture, buy, sell and deal in automobiles, motor busses and motor vehicles and to manufacture, buy, sell and deal in bodies and parts for same.

The Healy-Larsen Motor Co., 452 Jackson street, Milwaukee, has been named Stephens distributor in Wisconsin.

The Automotive Sales & Service, Inc., 210 South Main street, Fond du Lac, Wis., has acquired the Garford truck franchise for the central Wisconsin territory.

The Reutler-Dorsch Co., Milwaukee, is a new \$25,000 corporation organized by A. C. Reutler and E. H. Dorsch to retail the Chevrolet at North avenue and 38th street.

Arthur F. Eckstein, Milwaukee, president and general manager of the Eckstein-Miller Auto Co., until now distributor of the Marmon, has filed a voluntary petition in bankruptcy, scheduling liabilities at \$268,261 and claiming assets of \$21,981.

Goodyear tire dealers of Illinois will meet in annual convention at Springfield on April 23. H. P. Stout, factory man, will deliver an address.

The Hill Motor Sales Company, Oak Park, Ill., has been organized and will shortly open a garage and sales agency at 710 Madison street.

W. E. Howe has been appointed general representative for Rolls-Royce, Inc., in Albany and the northeast territory of New York State, with headquarters in Troy.

The Racine Rubber Tire Company of Philadelphia, 1303 Arch street, has been appointed distributor of Racine tires and tubes for this territory.

The Peninsular Motor Corporation, of Tampa, Fla., plans the construction this spring of a service station and garage to cost approximately \$50,000. The building will be two stories, and occupy a site 105 by 106 ft.

A two-storage garage in Fifth street, Niagara Falls, owned by Neilson & Bouk, was totally destroyed by fire recently. Seven automobiles valued at \$8,000 were destroyed. Total loss is estimated at \$10,000.

The Pittsfield, Winchester and Jacksonville Motor Truck line has been incorporated with \$5,000 capital stock to operate motor trucks between Pittsfield and Jacksonville by way of Winchester. Organizers are Basil W. Hendricks, Lewis E. McIntyre and Alva J. Hendricks.

The Campbell Finley Motor Co., Reo distributor, is the most recent organization to begin publication of a house organ which is called Reo Graph. It is done in colors and contains immediate sales information for car owners.

Among the new automobile agencies formed recently in the Southeast are the following: Creech Motor Co., of Spartanburg, S. C., with J. C. Creech as president; Laney-Gordon Motor Co., of Monroe, N. C., headed by T. B. Laney; Christian-Wade Motor Co., of Orlando, Fla., headed by A. B. Wade; Lake City Motor Co., of Lake City, Fla., headed by J. C. Coffin.

With O. H. Foley as president and E. Carson as secretary, the Hudson Motor Co. has been organized and incorporated at Sumter, S. C., and has taken over Hudson distribution in that section of the state. The new company is capitalized at \$10,000.

A new building to be used as a service station and sales headquarters is to be constructed this spring at West Palm Beach, Fla., by the Oliver Motor Co., at Third and Railroad avenues, according to R. E. Oliver, head of the company. The building will represent an investment of \$30,000 to \$35,000.

The Stebbins-Dentz Motor Co., Martin and Van Buren streets, Milwaukee, distributor of the Rickenbacker, has also been appointed distributor of the Cole in Wisconsin and Upper Michigan and will handle Milwaukee retail sales as well. The Cole was for eight years represented in this territory by the W. H. Krueger Motor Car Co., which recently consolidated with the Harry E. Wilson Garage Co. as the Krueger-Wilson Motor Co., to handle the distribution of the Marmon.

The Healy-Larsen Motor Co., 452 Jackson street, Milwaukee, which has been distributor of the Westcott for several years, has been appointed distributor of the Stephens Six. W. L. Kielsmeyer is sales manager.

John A. Kelly, formerly Baltimore manager for the Stutz Motor Co., has been made manager of the Cochrane Sales Co., distributor in Baltimore for the Rickenbacker and Duesenberg cars.

Auto Truck Company, of Tampa, Fla., is now headed by H. C. Allan, of that city, with G. W. Mitchell as general manager. O. D. Wetherell, one of the organizers of the company in 1921, and until recently president, has sold majority stock interest to other stockholders and is making arrangements for a new organization, which will probably handle the Ruggles truck. The Auto Truck Company will continue as distributor of Autocar trucks.

E. V. Davis, Rockford, Ill., has purchased the interest of his partner, M. E. Hamer, in the garage and sales agency, located for several years at 121 Mulberry street. The firm has been known as Davis & Hamer. Under the single owner, the name will be that of Davis Garage Company hereafter.

C. W. Manford has purchased the interest of C. F. Gydeson in the Manford-Gydeson Cadillac Company of Houston, Texas, and San Antonio. Manford becomes president of the company and controls Cadillac distribution in 109 counties in South Texas. He is one of the best known automobile dealers in South Texas and formerly was president of the Houston Auto Trades Association. He is a member of the national dealers association.

The Levene Motor Co. of Philadelphia has taken over the tractor parts business of the General Ordinance Co., with plants located at Derby, Conn., and Cedar Rapids, Ia. The parts stocks from both these plants will be moved to Philadelphia from which point complete service will be maintained.

The Capitol Tire Co., under the management of Norman and Sam Harris, has moved its place of business from 325 East Second to larger quarters across the street at 322 East Second. The concern has been in business in Davenport, Ia., for about a year and the rapidly increasing business made it necessary to seek larger quarters.

The Patton-Higgins Co. has secured the exclusive sales rights for the Velie in Kentucky and will have headquarters at 1529 South Third street, Louisville, Ky., after remodeling the present building. The company is composed of Samuel E. Patton and Fred Higgins.

The Cassler-Wilson Auto Company, 406 Franklin street, is the new dealer for the Chandler Six in Johnstown, Pa.

T. J. Connelly 121 Bridge street, Great Barrington, Mass., has the franchise for the Chandler car in this territory.

The Star Square Auto Supply Co., 1129 Locust street, St. Louis, Mo., has opened the first of a contemplated string of branch stores at 814 North Sixth street. Albert A. Sacke is president of the concern. The new store occupies a building 30x150 ft. The first floor will be devoted to retail sales and the second floor will be a stockroom.

Lambert-Graves Motor Co., Inc., Ford and Lincoln distributor at St. Louis, Mo., recently opened its sales and service building at Manchester avenue and Kingshighway.

The Peterson Motors-Baltimore, Inc., has taken salesroom space and service space for a term of years in the building of Neely & Ensor, McMechen street and Mt. Royal avenue, Baltimore. Neely & Ensor will continue to occupy their quarters in the building. At present Peterson Motors-Baltimore, Inc., occupy space at 1315 St. Paul street.

Whitcomb Motor Co., 215 Washington street, Burlington, Iowa, has taken the district agency for the Oakland car and is showing a complete line of models in its salesrooms.

The H. A. Mark Motor Company of Phillipsburg, Pa., has been made dealer for the Chandler Six.

The L. E. Gibson Motor Car Co., 1002 Highland Park Bldg., Clarksburg, W. Va., is the new local representative of the Chandler Six.

The Dayton Earl Motor Co., 311 West 3rd street, Dayton, O., is the new representative of the Chandler Six.

W. L. Cosner, 215 West Main street, Newark, O., has taken on the Chandler for this territory.

The Maple Avenue Garage, 319 West Maple street, Independence, Mo., is the new representative of the Chandler Six.

R. J. Brown is the new Chandler agent in Goring, Neb.

E. B. Edgerton has opened an agency in Greensboro, N. C., for the Jordan car. The Jordan is being introduced to the local public this week by a special Jordan show in the lobby of the Guilford Hotel.

V. A. Bradshaw has been made dealer for the Chandler Six in Genoa, Neb.

Eugene H. Schwartz has obtained the franchise for the Chandler Six in Elwood City, Pa.

Thomas Brothers, Sheffield, Ill., have closed their garage and sales agency in that city. Homes Thomas, junior member of the firm, will handle a line of motor car accessories and also operate a taxicab line.

Harry Parkinson, Clinton, Ill., has been appointed distributor for the Cleveland car in the DeWitt county territory, and will make his headquarters temporarily in the Sprague garage.

Elmer Hammond, Clinton, Ill., has been appointed distributor for the Gray motor car in the DeWitt county territory. He is now seeking a building in which to open a sales agency.

A new automobile agency has been established in Greensboro, N. C., under the name of Beasley Motor Car Company, with J. W. Beasley manager. The company will handle the Earl car.

FINAL OSHKOSH PLANS

OSHKOSH, Wis., April 23—Final action on plans for the reorganization of the Oshkosh (Wis.) Motor Truck Co. will be taken at a meeting of stockholders on Saturday, April 28. Under the plan it is proposed to transfer stock to make it possible to issue \$135,000 in bonds to retire the debt on the plant and provide working capital. During the past year the liabilities were reduced by more than \$100,000 and sales in the first quarter of 1923 were more than half of all trucks sold in 1922. Prospects for new business are now considered excellent and stockholders are generally pleased with the plan, it is stated. The plant has orders for fourteen trucks for immediate shipment and has established more than eighty local agencies in Wisconsin alone.

BUSINESS NOTES

Orlando Manufacturing Co., Orlando, Fla., is starting the manufacture of small front drive tractors for sugar cane, cotton and grove cultivation. This company also manufactures pistons, piston rings and piston pins.

The Dura Co. of Toledo, O., has organized a specialized division for the production of fine fittings for enclosed cars. Among the articles which it will manufacture are dome lights, corner lights, regulator handles, escutcheon plates, robe rail fixtures, kick plates, trunk bars, door handles and probably instrument board fittings.

The U. S. Products Co., of Pittsburgh, which formerly marketed its bearing fitting and valve grinding compounds through the Edward S. Cassidy Co., has installed its own sales department and will operate independently in the matter of selling.

The Gillette Rubber Co., Eau Claire, Wis., recently made the largest single shipment of tires by parcel post on record, to fill a rush order for 200 large-sized cord tires from Portland, Ore. This specified express shipment, but inquiry at the Eau Claire postoffice revealed that delivery could be made more quickly and even at less cost. A crew of clerks from the postoffice went to the Gillette works and checked and stamped the shipment, which had a combined weight of 4000 lbs., or two tons. The postage bill amounted to exactly \$501. Parcel post shipments of Gillette tires are not unusual, but no huge order like this was ever filled until now. Long distance deliveries by motor truck, tried last summer, will be resumed as soon as road conditions permit.

The Akron Oakland Co., of Akron, has been chartered with a capital of \$10,000.

Kesler & Brophy, Kalamazoo, Mich., distributors for the Chevrolet Motor Car Company, have moved their general offices from North Rose street to 329 Portage street.

The Western Tire Co., of Cincinnati, has been chartered with an authorized capital of \$25,000 to deal in auto tires, automobiles and accessories at 805 Race street.

The Nash-Woodland Motor Co., of Cleveland, has been incorporated with a capital of \$500 to buy and sell automobiles.

The Conneaut Taxicab Co., of Conneaut, Ohio, has been chartered with an authorized capital of \$10,000 to own and operate taxicabs.

The Ever-Ready Chevrolet Sales Co., of Cleveland, has been incorporated with a capital of \$40,000.

The Service Garage Co., of Cleveland, has been chartered with an authorized capital of \$500 to operate a garage.

The Rogers Chevrolet Co., of Orlando, Fla., is the name of a new distributing organization formed this month to handle the Chevrolet car in that section of Florida. The capital is \$50,000, and the new company is headed by L. B. Fort, of Orlando.

New automobile distributing companies recently formed in the Southeast are as follows: Panola Motor Co., of Batesville, Miss., headed by S. C. Bailey; S. A. Ryan Motor Co., of Miami, Fla., headed by S. A. Ryan, capitalized at \$150,000; Oliver-Garrett & Co., of Palatka, Fla., headed by Frank V. Oliver.

H. T. Taylor, R. H. Hurst and L. B. McLain, all of Monroe, La., have organized and incorporated in that city the Taylor-Nash Co., with \$50,000 capital stock, the new company to act as distributors of the Nash car in that section of Louisiana.

Headed by L. H. Dimmitt, of Savannah, Ga., one of the pioneer automobile dealers in the state of Georgia and a former official of the Georgia Automotive Dealers' Association, the Dimmitt-Buick Co. has been formed at Savannah as Buick distributors in that section. The new company succeeds the Georgia Auto & Supply Co.

The Willard battery dealers of Texas were in convention here this week. More than 100 dealers from all sections of the state discussed battery building and battery service with officials from the Cleveland office. The Texas convention is one of a series being held over the country.

Roamer Motor Car Co. of Illinois has changed its name to Chicago Roamer Co.

The Lee Auto Painting & Service Co. of Cleveland has been incorporated with a capital of \$10,000 to operate a complete service station for automobiles and to paint and trim automobiles.

The National Auto Brokerage Co., 32 W. 20th street, Chicago, has been incorporated with a capital of \$10,000 to deal in automobile accessories and supplies.

Courteous Service Stations, Inc., 11 S. La Salle street, Chicago, has been incorporated with a capital of 100 shares no par value, to own and conduct automobile filling stations.

The Good Rubber Co., of Akron, has been incorporated with a capital stock of \$10,000.

The Texas Presto-Lite dealers held their annual convention here this week. More than a hundred dealers and salesmen attended. Cooperation, small tank and gas appliances and salesmanship featured the discussions. There were several district managers from Oklahoma, Louisiana, Arkansas and New Mexico at the convention.

The experimental plant and office of the Lonerger Automobile Radiator Company is shortly to be removed from Davenport, Iowa, to Moline, according to W. H. Carr, fiscal and purchasing agent. The radiator, which was invented by P. H. Lonerger of Rock Island has been given many tests.

Indiana Parts Depots, Inc., Kansas City, Mo., has been incorporated with a capital of \$10,000 to manufacture, purchase and sell, both at wholesale and retail, motor trucks, parts and accessories and all supplies therefor.

Bettagas Co. of Kansas City, Mo., has been incorporated with a capital of \$200,000 to manufacture, sell and distribute motor fuels and lubricants.

The Stewart-Drake Corp., North Kansas City, Mo., has been incorporated with a capital of \$20,000 to buy, sell, manufacture and repair automobile and truck bodies, and all kinds of automobile and truck equipment.

The Valley Motor Co., of St. Louis, Mo., has been incorporated with a capital of \$10,000 to do a general automobile, tire, gasoline, oil, accessory and repair business.

Acme Auto Glass Co., Inc., of St. Louis, Mo., has been incorporated with a capital of \$2000 to buy, sell, repair and fit automobile glass and other glass equipment and fixtures, and automobile accessories.

Ricker Wilson Co., Kansas City, Mo., has been incorporated with a capital of \$10,000 to deal in automobile tires, supplies and accessories.

The Cathcart Garage Co., 4619 Delmar avenue, St. Louis, Mo., has been incorporated with a capital of \$35,000 to do a general automobile and garage business.

Motor Industries Corp., Kansas City, Mo., has been incorporated to manufacture, buy, sell and deal in parts and accessories for automobiles, trucks, tractors, aeroplanes and all types of internal combustion engines, motorcycles and motor vehicles.

Hemphill-Overland Motor Company of Kansas City has been incorporated with a capital of \$50,000 to manufacture, buy, own, sell or otherwise dispose of automobiles, automotive vehicles and automobile parts and accessories; to conduct a service station and repair shop; to rent, hire or lease the use of automobiles or automotive vehicles.

Motor Finance Corp., St. Louis, Mo., has been incorporated with a capital of 1000 shares no par value, to manufacture, buy and sell.

The Voltage Regulator Co., 10 S. LaSalle street, Chicago, has been incorporated with a capital of \$1000 to manufacture and deal in machinery, electrical motors and generators, etc.

The entire organization of the Tungsten Spark Plug Co. has been moved from Marshalltown to St. Joseph, Mo., 1119 Frederick avenue. The new managers will maintain a strictly jobbing policy, selling only through established jobbers.

The Bliss-Williams Motor Car Company has been organized at Rockford, Ill. Capital stock has been fixed at \$5000. The promoters include C. E. Williams, E. H. Bliss and J. B. Bliss. It is planned to operate a sales agency and also carry a line of accessories. In addition, a general storage and repair business will be handled.

The Southern Illinois Motor Car Company has been organized at Christopher, Ill., and has opened a garage and sales agency at 212 East Market street. Capital stock has been fixed at \$10,000. The promoters include Ray Dodge and A. E. Pike.

The Avenue Park Garage Company has been organized, and a new plant has been opened at 830-36 North Boulevard, Oak Park, Ill. Capital stock has been fixed at \$100,000. Promoters: James Wulpi and Lester McAllister.

The Niagara Garage at First and Niagara streets, was destroyed by fire recently, inflicting a loss of \$15,000. Seven automobiles went up in the flames.

Parts Factories Work Hard to Keep Up with Demands

Skilled and Unskilled Labor Is Short; Outdoor Employment Lures Men Out

MILWAUKEE, Wis., April 23—It is particularly noticeable in the units and parts division of the automotive industries that the demand from manufacturers of motor trucks is assuming broad proportions and in some instances makers are falling behind on deliveries because they are unable to increase output as rapidly as the increased demand calls for. So far as passenger cars are concerned, even the installation of 24-hour production schedules has not brought relief from the tremendous pressure.

The tightness in the labor situation is forcibly impressed now that outdoor employment is luring common labor out of shops. One large construction firm here is bidding for men at 50c hour on an 8-hour a day basis. Numerous parts and equipment concerns are compelled to outbid such rates to hold their common labor. Skilled and semi-skilled men on production jobs are so scarce that those who want to install night shifts cannot man these sufficiently. Within the past week to 10 days, classified advertising columns of local newspapers contain more and more requests for all classes of labor from outside industries, even distant industrial centers like Cleveland, Detroit, Pittsburgh and Toledo.

The lack of a labor supply as well as due caution against the possibilities of over-expansion are factors in making industries, automotive and otherwise, proceed slowly with plant extensions that present and immediate future demand for their products certainly justify. Even if, as has now been proposed the immigration bars be let down, efforts will be moderate, for this relief would not be felt in the high-skilled trades.

In recognition of the fact that the major relief must come from the invention of machinery that will save labor to an even greater extent than the modern designs now in production, machine tool manufactures here are bending to make them more nearly automatic and less dependent upon the most skilled type of labor for operation. Several concerns in Wisconsin have recently announced the perfection of such instruments and already they are fairly swamped with orders in the fight of employers to offset labor shortage so far as possible.

Incorporation papers have been filed for the Auto Brakes Service Co., Inc., Buffalo, N. Y.

Christian VerCais, Kalamazoo, Mich., has resigned as traveling representative of a candy company and opened the "Square Deal Garage," 118 So. Edwards street.

The Davis Motor Car Corp. has been organized in Winston-Salem, N. C., with a capital stock of \$50,000. The company will act as distributor for the Davis car. Fred T. Davis will be general manager of the local concern.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Responsibility of Garage in Case of Fire

Q—Please advise us regarding the following as applied to Minnesota laws:

Is a garage owner responsible for stored cars in case of fire? Does the fact that a sign is displayed stating that "Cars are stored here at owner's risk" change the matter any? If the garage owner is responsible, would a release from such liability, signed by the owner of the car, release him from liability; i. e., a statement signed by the car owner that he assumes responsibility in case of fire?—Babcock Bros., Markville, Minn.

The general rule of law is that the garage owner is not responsible for stored cars in case of fire. This applies to Minnesota and all states. But where the fire is the result of negligence of the garagekeeper, he is responsible in law, and his responsibility may be established in a tort action for damages.

The usual sign which you quote will not relieve the garage man where the loss can be shown to be the result of his negligence. In case of suit, such sign might prove important in shifting the burden of proof.

A release from liability signed before the liability arises is of no avail, in my opinion. Another question arises here and that is that such a contract with a release might run counter to the rule of public policy; that is, that it would be against the public policy to permit such provisions to be given full effect, and therefore they would likely be held illegal and void.

However, where the provision reads that the car owner "assumes responsibility in case of fire" quite a different proposition of law is presented, and such a provision is valid. I am of the opinion that such a provision not only settles the question of claim for fire loss where the garage man has not been negligent, thus causing or contributing to the fire, but it may prevent recovery under more extreme circumstances, as where the fire resulted from his negligence. However, courts have held that one may not contract away in advance his responsibility for his own negligence, saying that to permit such would be against public policy in that it would induce carelessness and foster negligence. And there you are. Anyway, the provision is a good one.

WANTS ELECTRIC KNOCK DETECTOR

Q—Send us diagram and instructions for making an electric apparatus for detecting engine knocks. Is such a device efficient, and would it be of sufficient value to warrant our making one?

1—We do not know of any electrical device of this nature. The sonoscope,

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

which is the name ordinarily given to a knock detector, is made up from a head piece similar to a receiving phone combined with a rod which can be extended to touch various parts of the engine. The vibration is transmitted up the rod to a diaphragm so that the vibrations are made audible. While the device looks like a telephone receiver, it has no electrical characteristics whatever.

2—Is it possible to convert a 4-cylinder DU4 Bosch magneto into a 6-cylinder by using a 6-cylinder distributor?—Campbell Garage, Hatton, Wash.

2—This is not practicable. The reason is that in a 4-cylinder magneto you need a gear ratio between the armature and distributor of 2 to 1, while in a 6-cylinder magneto you need a ratio of 3 to 1. This means that both the gears on the distributor and armature are wrong and the center to center distance is also different. It is accordingly inadvisable to try to make such a change.

How Many Revolutions of the Wheels Per Mile?

Q—Give the following information: Number of revolutions of a 32x4 tire with gear ratio of 4.4 when car travels one mile.

1—To determine the number of revolutions made by the wheel in going a mile we have to find the distance around the wheel in feet. To get this we multiply the diameter of 32 in. by 3.1416 and divide by 12. This gives 8.38 ft. as the distance around the tire. There are 5280 ft. in a mile so we divide this figure by 8.38 and the answer is 630 revolutions per mile.

2—Give the number of revolutions of a 34x4 wheel with a gear ratio of 4.7 when car travels one mile.

2—We figure this out in similar manner and the answer comes 593 revolutions per mile. You will note that it is not necessary to state the gear ratio in taking this calculation and we accordingly feel that you have asked the wrong question and that the answer will not do you very much good.

3—Would an engine give the same power with 34x4 tire, using 4.7 gear ratio as it would with 32x4 tires and a 4.4 gear ratio?—D. E. F. Mueller, Dyersville, Iowa.

3—This question has more meaning to it than the other two. In practice you will not be able to notice the difference. If the 4.7 gear ratio were changed to 4.67, the effect would be exactly the same. For comparison would refer you to page 45 of the February 1 issue of MOTOR AGE. Drawing diagonal line for these two conditions you will note they both hit the car constant line at about the same point.

RAISING CHARGING RATE OF WESTINGHOUSE GENERATOR

Q—Answer the following inquiry in regard to a Westinghouse generator. How can the charging rate of this generator be increased to 12 or 15 amp. and is it advisable to do so? This refers to the generator on a 1921 Hupmobile which only charges 7 or 8 amp.—Ernest Newman, Storm Lake, Iowa.

1—For average usage 12 or 15 amperes will be satisfactory, although the lower limit will probably be sufficient in summer.

The adjustment is made by removing the commutator cover and loosening a hex nut which holds the third brush holder. It is then necessary to push the holder one way or the other until the proper adjustment is obtained. Moving the third brush holder in the direction in which the armature rotates will increase the charging rate while moving it against rotation will decrease the charging current.

Architectural Service

IN giving architectural advice **MOTOR AGE** aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among

other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected they will be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

Four-Story Garage in Middle of Block

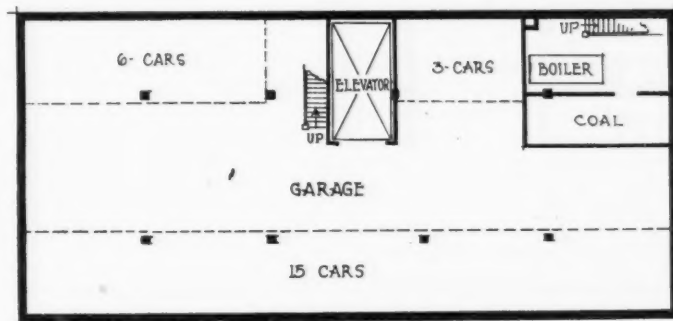
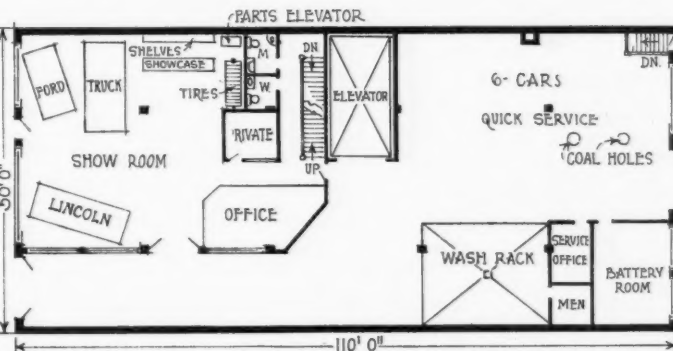
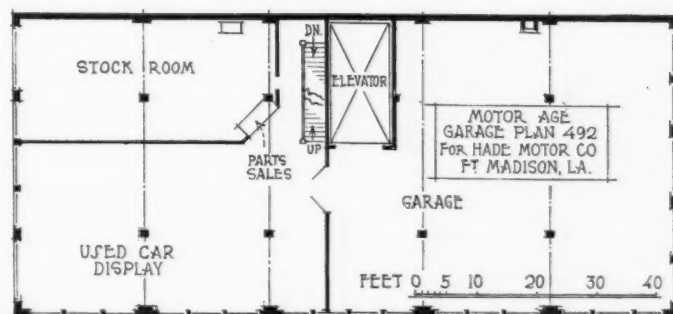
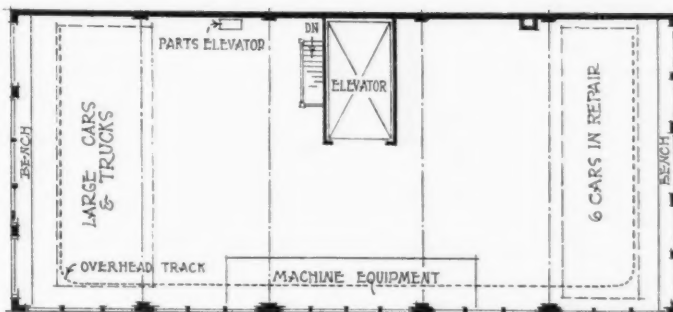
We are about ready to build a new garage. We sell Ford trucks and Fordson tractors. We also expect to store cars. The lot is 50x110 ft. and is in the middle of the block, facing north. We expect to use the front of the main floor for showroom and parts room. We will need quite a space for parts, as we carry a large supply on hand. We would like to have a shop on the second or third floor. We expect to have light on three sides of second and third floor. We expect to have a basement under all. Where is the best place to have the electric elevator, also the wash rack? We are going to have a battery station and one service man on the main floor in the rear. Kindly give us some suggestions on this building.—Hade Motor Co., Ft. Madison, Ia.

We have laid out the four-story building that you insist you must have, and hope that the plan will meet with your approval. We have, however, made some changes from your suggestions. The stockroom we have moved to the second floor where it will be fairly convenient to retail customers and at the same time bring them in contact with the used car display room. Parts may also be sold at the accessory counter and delivered from the stockroom by a small electric elevator which will also deliver them to the shop floor.

Our plan calls for a 20 ft. elevator, but if you could use an 18 ft. one there would be considerable advantage in that cars could get on and off of it with less trouble. Of course, your Ford cars will have no trouble at all, but the Lincolns and Ford trucks may.

We have set the basement aside for car storage exclusively and given half of the second floor to that purpose, also. In so small a building, we think it impossible to do any storing on the first floor unless, possibly, it is over night storage of cars that would be leaving early in the morning. In that case, the wash rack could be used for three cars and the opposite side for three more, leaving only the rear space for quick service.

We have made an outside entrance to the polishing room, which is required in most large city ordinances, and have located the coal holes for filling the coal bins on the ground floor. You will note that there is a slight irregularity in the position of two of the columns in the center of the building. It is quite important to locate these as we have shown, in order to facilitate the movement of cars. The top floor, of course, is post free, being supported by trusses.



CLEANING CARBURETER INTAKE SCREEN

Q—What will clean a black deposit from fine-mesh brass wire strainers used on gasoline intake at carbureter? This coating cannot be blown or washed out and in time closes up the entire screen (low-test gasoline being used).—Alfred H. Young, Johnstown, Pa.

The following formulas are taken from the Scientific American Book of Formulas. The Government method prescribed for cleaning brass and in use at all the United States arsenals is as follows: Make a mixture of one part of common nitric acid and one-half part of sulphuric acid in a stone jar having also ready a pail of fresh water and a box of sawdust. The articles to be treated are dipped into

the acid, then removed into the water and finally rubbed with sawdust. This immediately changes them to a brilliant color. If the articles are greasy, they are first dipped into a strong solution of potash and soda and warm water, which cuts the grease so that the acid has free power to act.

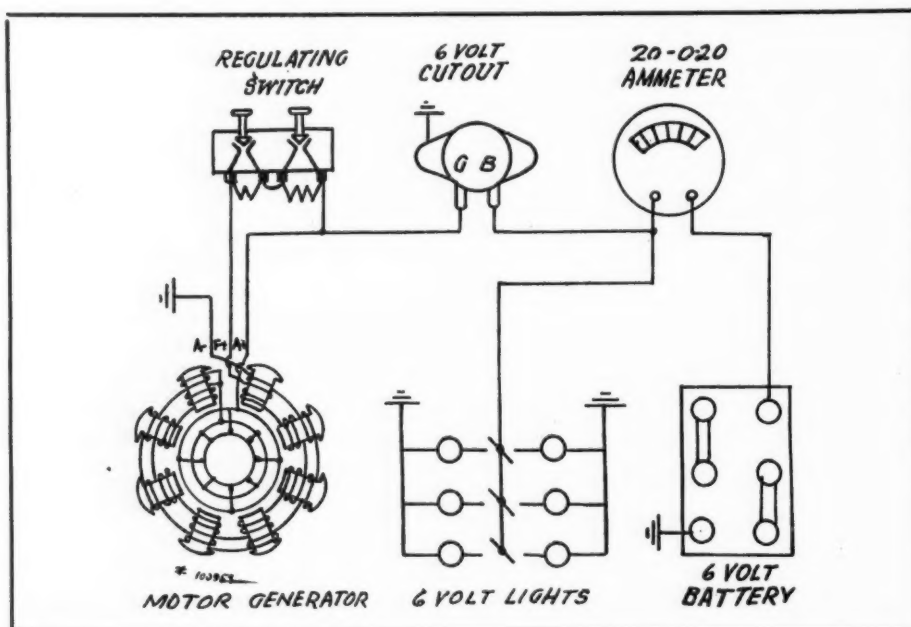
This formula, although it may be excellent in removing deposits, is not the best method of handling the situation. We would advise that you determine the cause of the deposit, which apparently is due to sediment in the gasoline tank. Low-test gasoline contains no constituent that would leave a black deposit, and if this is present it is due to matter that is entering the gasoline tank.

THREE TO ONE RATIO TOO FAST FOR COUPE

Q—In regard to the Ford coupe of A. E. Wittman, Ford agent, Humboldt, Iowa, on which an article appeared on page 41 of the March 8th issue of Motor AGE. The ratio of 3 to 1 is too fast for a Ford coupe. We also feel that the oil splash pan should be raised to its original position. We also think that the new rings he installed may have been put in without sufficient clearance, so that when the engine gets hot, the rings bind against the cylinder wall. We have found that a gap of .003 to .004 is required between end of the rings in a Ford engine.—F. L. Steward, Twin Brooks, S. Dak.

(NOTE—Motor AGE wishes to express appreciation for the above solution sent to us.)

Simplifying Electrical System on Rambler



U. S. L. changed to 6 volt system on 1914 Rambler

Q—We would like to know if it is possible to rearrange the generator which is a U.S.L. type on a 1914 Rambler Cross Country model so that a 6 volt battery may be used for lighting purposes. We do not care whether it operates the starter or not. A 24 volt battery is required for the starter and as such batteries are rather expensive we do not wish to install one if it is possible to use a 6 volt system. The car is in perfect condition, as it only has been run about 2000 miles, and has been in storage for several years.

1—We have made up a diagram to illustrate the circuits required. The series paralleling switch will no longer be needed and as the carbon pile regulator and cutout is designed for use with a 12 volt generator it can no longer be used. The motor generator itself is supposed to generate on 12 volts, but as it has plenty of output we believe it can be made to work as a 6 volt generator. Here some experiment will be necessary in connection with a regulating switch. This is a standard two gang lighting switch with iron wire or German silver

wire resistance connected as shown. The purpose is to limit the output by putting resistance in the circuit of the shunt field. The cutout is any standard 6 volt cutout and practically any ammeter will do, the one already on the car being satisfactory if in good condition.

The lighting circuit formerly operated on a 12 volt battery but was split so that each light operated on 6 volts. We have accordingly shown the switch portion of the lighting circuits connected through the ammeter to battery and the other side of each lamp connected to ground or the frame of the car. By making the system a grounded one, it simplifies the wiring considerably.

2—We would like to know if it is possible to have demountable rim wheels put on, say, about 34x4 size, in place of the 36x4 now in use and we would like to know name of concern that can do this work.—Chas. G. Thex, Otter, Mont.

2—It is possible to have this done and names of concerns will be given by letter.

WHEN BATTERY STANDS FOR 7 MONTHS, WHAT?

Q—Will a battery last seven months in storage; that is, with the car not running at all during that time?—Joe Fun, Oakland, Cal.

1—A battery left for this length of time will not only be completely discharged but also badly sulphated. The general rule is that a battery discharges itself without any current taken from the terminals at the rate of about 1 per cent a day so that in 100 days it would be completely discharged.

The damage results not so much from the discharge as from the fact that the normal sulphate which forms on the plates during discharge changes to a

crystalline form which is very difficult to change back again.

For this reason a battery which has been left for seven months will be in a badly discharged and badly sulphated condition. It will have to be given very careful treatment and slow charge for a long period of time to destroy the sulphated condition. In some cases it is practically impossible to bring such a battery back to normal conditions and in any event its life is shortened.

VARIATION OF PISTON SPEED IN ONE REVOLUTION OF CRANK

Q—Is it not true, that there are four variations of piston speed to one revolu-

tion of the crankshaft in any automobile engine? If an engine has a stroke of $4\frac{1}{2}$ in., does not the crankpin travel 14.14 in. in one revolution of the engine while the piston travels 9 in. In what order do the variations in piston speed occur?—F. A. Stephens, South Bend, Ind.

In general you are correct in saying that there are four variations of piston speed, although to be technically accurate, there are an infinite number of variations in the speed. For example, when the piston is at the top of the stroke it is standing still for a brief instant. Then as the crank starts to travel on its downward motion the piston also moves downward, but very slowly at first. The speed increases gradually and is at maximum when the crank has turned approximately 90 deg.

From this point on, the piston starts to go slower and slower until at the bottom of the stroke it is again standing still. On the up stroke the same process is repeated, the piston speed increasing and then gradually decreasing to zero. With a $4\frac{1}{2}$ -inch stroke we have the crank pin traveling in a circle whose diameter is $4\frac{1}{2}$ inches. The circumference of a circle is obtained by multiplying the diameter by 3.1416 and in multiplying $4\frac{1}{2}$ by this figure we get the figure you give of 14.14. We would suggest that you study some book on automobile and gas engine construction and we are accordingly giving you the name of such a book by separate letter.

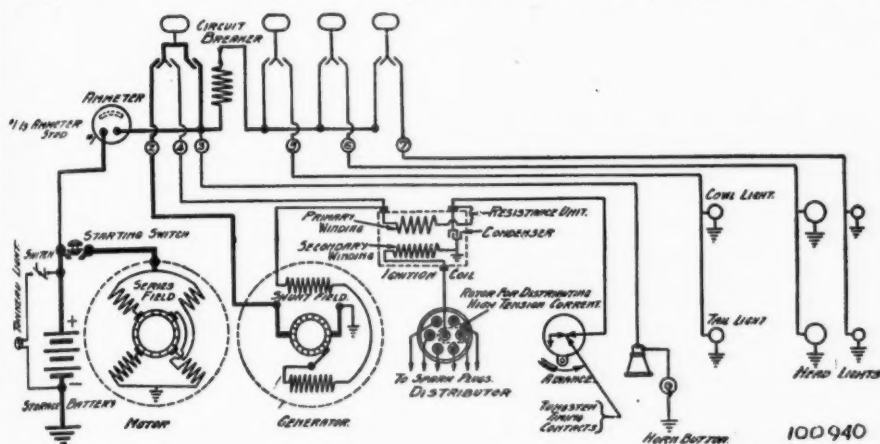
32 VOLT BATTERY IGNITION ON OLD ENGINES

Q—We have two Studebaker engines that we can sell if we can reduce the current of a farm lighting plant to use for ignition. Both engines are equipped with Remy ignition systems using storage battery for ignition. Can the voltage of the farm lighting plant be reduced by the use of bulbs so we could use the current for ignition instead of a 6-volt storage battery?—Hughes & Farrell Garage, Littleport, Iowa.

It is not advisable to try to use a 6-volt coil, as you will be wasting considerable current. It is a possibility, however, to put in resistance of any sort which will allow the same current to flow on 32 volts that would formerly flow on 6 volts. The better method, however, would be to get new ignition coils from some concern making a 32-volt lighting plant. If such a coil contains a condenser you can then use the regular interrupter and distributor that is now standard equipment on the engine. If the coil itself does not contain a condenser, it would be better to buy both coil and condenser and connect the proper condenser across the contacts in place of the one now in use. You would then have the system as originally designed.

Name of concern in your territory capable of supplying such coils will be given by letter. If there is any question whatever as to the proper way of connecting, would suggest your writing to us after you get the coils, giving us a description of them, with a sketch showing terminal location.

Diagram as Guide for Systematic Testing Olds 37A



Q—We have had considerable trouble with an Oldsmobile model 37A which has developed a queer ailment. I can be driving along hitting on all six when all of a sudden all six will cutout at one time. Sometimes after rolling a few feet they will resume firing as regularly as before, then again I may roll to a complete stop, with the car in gear and the engine turning over but not firing without the motor making an attempt to fire, then by just stepping on the starter button it will start right up. Occasionally after coming to a complete stop it will not start for some time, coax it every way you will, it will not start until it is ready to do so. The car has been gone over and work has been done on the carburetor and distributor but still the trouble persists.

This does not happen at any certain time nor after any certain distance of travel. I can go 50 miles or more without any trouble, then in 50 feet it may cutout as many times. It has never cutout while running without a load. Sometimes while trying to get the car in motion it will cutout quite a number of times in going from first to second speed before I finally get it into high. Advise what causes this trouble.—Carl T. Hallenberg, St. Louis, Mo.

Intermittent troubles such as this are difficult to locate. The most successful method is to go after the trouble in a systematic manner, eliminating one source of trouble after the other. The following tests should be applied in the order written: While the engine is running disconnect from the coil the wire that connects the center of the distributor and holding it approximately $\frac{1}{2}$ of an inch from the coil terminal, note whether the spark jumps from the terminal to the wire without any missing or interruption.

If the test here shows O. K. and the secondary terminal on the coil appears tight when it is taken hold of with a pair of pliers, proceed to the next test. A reasonable amount of pressure should be applied to the secondary terminal in question to detect a loose connection. The next test is a check on the primary circuit. Disconnect both wires that are connected to the generator (one wire is No. 2, which comes from the ignition switch, and the other is the primary from the ignition coil). With the ignition switch placed in the "on" position, crank the engine to a point where the interrupter points are closed. If the primary circuit is O. K. the ammeter

should show a discharge of approximately 5 amperes. If the needle fluctuates it indicates loose connections or trouble at the interrupter points.

The test for loose connections will be covered later. If the ammeter reading is considerably less than 5 amperes, allow the switch to remain in the "on" position for about five minutes. This will allow current to pass to the points and tend to make better contact because of the heat generated. The points should be smoothed by grinding or filing if their faces do not make good contact.

Provided the last mentioned test does not expose any trouble it is advisable to test the primary circuit from the battery through all units to the interrupter and coil. A voltmeter or test lamp can be used to advantage, although if neither are available a length of wire can be used. Begin at the positive terminal of the battery and with one end of the wire or one side of the meter connected to it flash the other side of meter or end of the wire to a grounded portion of the car. If a spark occurs when the wire touches the frame or any grounded part it indicates that there is current flowing in the wire being tested. The meter will indicate a reading if the same condition exists.

The next point to test from is one side of the ammeter. From one side of the ammeter the test should be continued to the opposite terminal, from this terminal to the No. 3 terminal on the ignition switch. If current appears at the No. 3 terminal the next point of testing is the No. 4, which leads to the primary winding of the coil. If current appears at the point where the No. 4 wire enters the coil, the next test is at the other primary terminal where a wire leads from the live interrupter terminal of the breaker mechanism.

It is advisable when making this test, even though all wires test O. K., to pull on the wires where they fit into terminals, as there is a possibility that the wire is broken inside of the insulation. It is impossible to state whether this trouble would be due to loose connections either in the secondary or primary, but indications would point to something wrong in the primary circuit. If at any

point no spark or meter reading occurs, it is proof of a loose or broken connection between that point and the point previously tested.

WHICH BATTERY TERMINAL SHOULD BE GROUNDED?

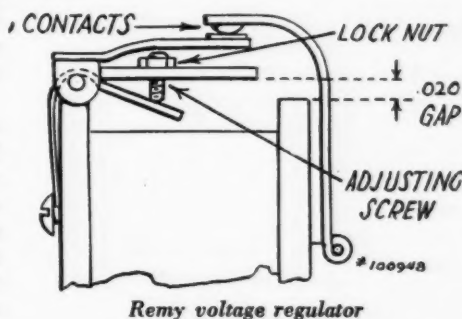
Q—Why do different cars call for a different way of coupling up the battery? For example, the Gray & Davis systems on Ford cars call for grounding the positive, while the standard Ford system uses the negative terminal for the one that is grounded.—Thos. D. Birks, Chicago, Ill.

There is no particular reason for grounding the positive any more than the negative. However, after the battery has been installed in either way and the ammeter reads correctly, it will cause an incorrect reading of the meter if the battery is reversed. Reversing the battery will also sometimes cause trouble at the cutout unless the cutout points are closed once by hand before the engine is started. About the only possible electrical system on which it would really make any difference would be some of the very old type generators where permanent magnets were used. On the modern systems, however, there is no engineering reason for doing it in either way, as one is as good as the other.

RAISING REMY 168 GENERATOR CHARGING RATE

Q—We would like to know how to raise the charging rate of a Remy generator, model 168, as used on a 1916 Auburn, model 6-38.

1—The generator in question uses a voltage regulator, the operation of which depends on the action of a pair of vibrating contacts. The adjustment is shown in the illustration. To increase the charging rate it is necessary to unsolder the lock nut so that the adjusting screw may be turned. The screw should



then be turned down; in other words, in a clockwise or right hand direction until the necessary charging rate is obtained. This should be 12.5 amperes. The lock nut should then be tightened and the output again checked. If the output is still satisfactory the nut should again be soldered to prevent its coming loose.

2—Would like to know the address of a company making Bailor motor cultivator.—Emerich Schnell, Franklin Grove, Ill.

2—This is made by the Bailor Motor Cultivator Co., Atchinson, Kan.

Radiator for Aviation Engine

Q—We are installing Hispano Suiza 220-hp. aviation engine in an automobile chassis for dirt track work. What size radiator in square feet of cooling surface is necessary for this engine, both with and without fan, allowing, of course, for a reasonable degree of safety?

1—The amount of cooling surface necessary is dependent on the air velocity through the radiator. Calculating the velocity at approximately 55 m.p.h. without the use of a fan, approximately 800 to 900 sq. ft. of radiating surface will be required. With the average type of radiator core, either tubular or cellular, of 4 in. depth, there will be required for the same air velocity approximately $8\frac{1}{2}$ to $9\frac{1}{2}$ square feet frontal area of radiator. These figures are based on full power output of the engine at a velocity of 55 m.p.h. If the car speed is in excess of this the area, of course, can be decreased.

We believe that for dirt track work you will not be able to maintain any speed in excess of 75 m.p.h., and with this velocity and a 4-in. depth core the radiator size required would be so great that the appearance would be bulky and would probably obstruct the vision of the driver. If the core depth is increased to 7 in., the frontal area may be decreased to approximately $5\frac{1}{2}$ sq. ft., using a fan, and to $6\frac{1}{2}$ sq. ft. without a fan.

2—Would a light-weight rear end stand up under the strains imposed upon it by an engine of this size using $32 \times 4\frac{1}{2}$ wheels, about 2.75 gear ratio, with total weight of car not to exceed 2,200 pounds?

2—The rear axle designed for an en-

gine of 60 hp. will give satisfactory service for racing but would be entirely inadequate for work on roads where the maximum torque of the engine will be delivered to the rear axle.

3—What weight flywheel would you recommend for this service? The one we are installing is 17 in. in diameter.—F. E. Brown, care Pure Gasoline Co., Haskell, Okla.

3—A flywheel that will give steady running at 300 r.p.m. should have a rim weight of not less than 75 pounds, that is, rim weight exclusive of spokes or hub, for a diameter of 17 inches.

CRACKED CYLINDER HEAD CAUSES STEAM IN THE EXHAUST

The following is received from Roy H. Bedell, Saranac, Clinton County, New York:

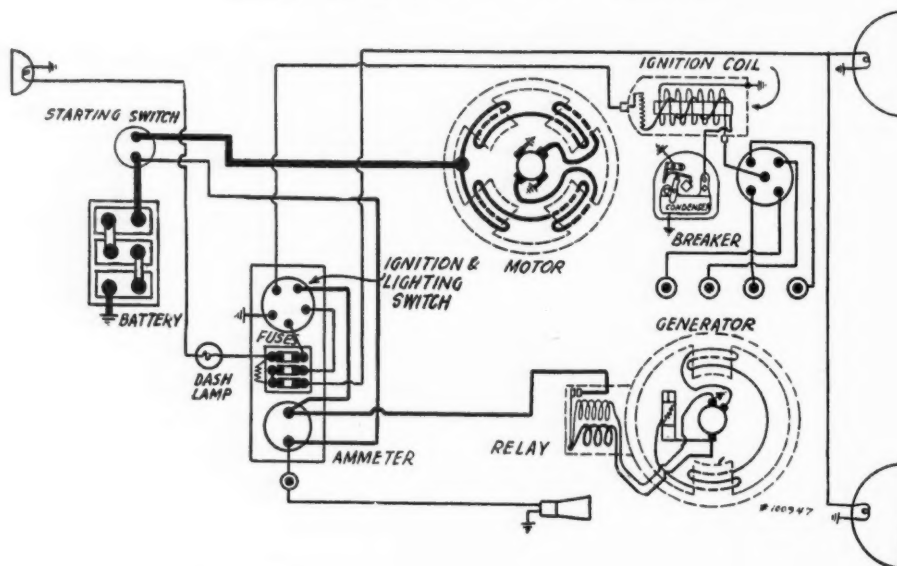
"If Louis Deig will examine the cylinder heads on his 8-cylinder Oldsmobile he will find them cracked so that water is getting into one or more of the combustion chambers and forming steam that shows as 'white smoke' from the exhaust.

"It is sometimes difficult to locate these cracks, but by trying another head he can determine for sure if this is the trouble. We had this trouble on a Ford car and with the radiator cap off the exhaust would come out of the top of radiator.

"I would be glad to know if this locates trouble."

We are thankful to this subscriber for his co-operation and believe that this is a very probable diagnosis of the trouble in question.

Wiring Diagram of 1917 Harroun



Q—We have a Harroun motor car, year 1917, model S.A.A., and do not know the address of the Harroun Co. and have been told they are not in business. This car was in a fire and the wiring was damaged and we do not know how to replace it. Tell us how to wire this system and whether this company is still doing busi-

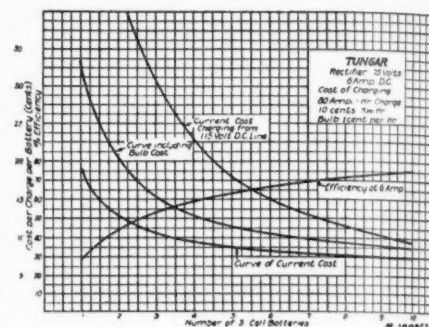
ness.—William Crawford, Jersey City, N. J.

Wiring diagram of the 1917-1918 Harroun car is shown. The Harroun company has been disorganized and is not producing cars.

EFFICIENCY AND COST OF CHARGING WITH TUNGAR RECTIFIER

Q—Tell me what the efficiency would be of a 10 battery Tungar rectifier where it is generally used with only one or two batteries on the line at a time.—W. A. Mast, Lavina, Mont.

We are showing a curve or series of curves which give not only the efficiency but the cost of charging batteries under various conditions.



From this illustration it is possible to figure the cost of charging any number of 6 volt batteries. For one 6 volt battery, for example, it will be seen that the efficiency is down to 30 per cent, while the cost of current is up to about 18 cents and the cost of current, including the bulb, is about 33 cents. When we come to the case of charging two batteries at once the efficiency has come up to 45 per cent and the cost of current has dropped to $12\frac{1}{2}$ cents and the cost of current and bulb has come down to about 20 cents. When we take the other extreme and have 10 batteries charging at once we find that the efficiency is up to 75 per cent, the current cost has dropped to $7\frac{1}{2}$ cents and the cost of current and bulb has dropped to about 9 cents.

The other curve shows a comparison of what the cost would be when charging from a 115 volt direct current line by means of lamp bulbs or resistance units. In case it should be possible to charge 15 batteries at once and direct current would be available we should find the cost would be lower in this case, but with a few batteries the Tungar rectifier gives greater efficiency and with alternating current, charging directly from the line is out of the question anyhow.

PISTON DATA ON 1915 BUICK

Q—We have a 1915 Buick Big 4 model C37, engine No. 107023. Give bore and stroke and size of rings and piston pins required for same.—Harry Lamborn, Prop., Gould Battery & Service Station, Burlington, Kan.

1—The bore and stroke of the Buick C37 was $3\frac{3}{4} \times 5$. The compression distance on the piston is 2 in. Distance between bosses, $1\frac{1}{2}$ in. The pin hole diameter is .923, the length of the pin $3\frac{3}{4}$ in. Three rings are used all above the piston pins. The width of the ring grooves is $\frac{3}{16}$ of an inch.

Operation of Buick Starter Explained

Q—Explain the operation of a starting motor on Buick cars, model 1917 and later.

1—The generator brushes normally rest on their commutator, but the action of the starting mechanism in the released position is such that one starter brush is held up off of the commutator. Turning on the ignition switch allows battery current to flow not only to the ignition coil but also to the field and armature circuit of the generator portion of the motor generator.

This allows the machine to operate as a motor with current flowing to the generator windings. A roller clutch at the front end of the motor generator permits this rotation. With the armature turning slowly it is now easy to mesh the gears, this being accomplished by pushing on the starter pedal. The action of the starter pedal mechanism is first to mesh the gears and at the last bit of motion one generator brush is lifted from the commutator and the lifted starter brush is dropped onto its commutator. The dropping of the starter brush acts like closing a starter switch and allows the machine to crank the engine.

If the mechanism is not properly adjusted and the generator brush is not lifted from the commutator, the machine will crank the engine very slowly, as it is trying to act as a generator at the same time it is working as a starter, and the extra load accounts for the slow speed. When the starting pedal is released, the starter brush is lifted and the generator brush put back so that the machine can operate as a generator and can charge the battery.

Cranking Tight Engine May Overheat Starter

2—If bearings were all tightened on a

Buick car and were made so tight that the engine could not be started by means of a hand crank and starter combined, but this is tried and the generator begins to smoke, would it burn up the field coils, or the armature or the brushes and springs? Would any other harm result to the motor generator? We have had various opinions advanced. Some say it will burn up the field coils, others say the brush springs only would be burned up, while still others say no harm would result. What is your opinion?

2—The average starting motor draws approximately 125 to 150 amperes while cranking the engine, but if locked and connected to the battery will draw 500 or 600 amperes, these figures varying with the type of engine and the type of starting motor considered. It may be that on some starting motors no harm would result from connecting directly to the battery when the load is so great that no rotation is possible. The brushes and connections, however, are probably the smallest portion of the circuit and in any electrical circuit the smallest portion is the place where the greatest heat is developed.

We believe that you will find that on the grounded brush there is an arm which rocks around a pivot, this pivot being mounted on a plate which can be removed when it is necessary to inspect the brush. The connection here depends on the brush arm and pivot being clean and bright, so that a good ground connection is made, and even in ordinary service it is sometimes found that the brush will burn out due to a poor connection on this pivot. The remedy is to remove the brush arm and use sandpaper for the pivot and a small round file to smooth up the interior surface, and then, when the brush arm is replaced, solder a flexible connection from the brush arm to the grounded plate. If this precaution had been taken previous to your test, we doubt if you would have noticed any-

thing except that the starting motor was incapable of turning.

Spoiling the Job With Old Piston Pins

3—Have you any idea what a knock in a Buick car would be? After all bearings were tightened without putting in new wrist pins, for while they were loose it was a holiday when the work was done and we could get no pins. After the job was put together we found that by shorting No. 2 plug with a screwdriver an awful slap was heard. This showed up on No. 2 only and disappeared when the screwdriver was taken off.

3—One way to determine the difference between wrist pin and piston knock as compared with connecting rod knock is to remove the spark plug in the cylinder under consideration and put in about a tablespoonful of 600W, this being done as an experiment only and not by any means as regular practice. The effect of the 600W is to temporarily cushion the piston and wrist pin. If this overcomes the condition of knocking it shows that the pistons or wrist pins were at fault. From your description we would say that the noise produced by shorting the plugs was due to a wrist pin, while if the noise had decreased it would probably indicate piston slap. These tests, however, are rough indications only, as it is very nearly impossible to give any test which will hold true under all circumstances.

Handley Knight Clutch

4—What kind of a clutch did the Handley Knight use in their late cars?—A Reader.

4—Warner.

CLOGGED MUFFLER CAUSES OVERHEATING

Q—We have heard the assertion made that a muffler and exhaust pipe clogged with carbon will cause overheating and loss of power. Is there anything to this? If this is true, how often should the muffler and exhaust pipe be cleaned?

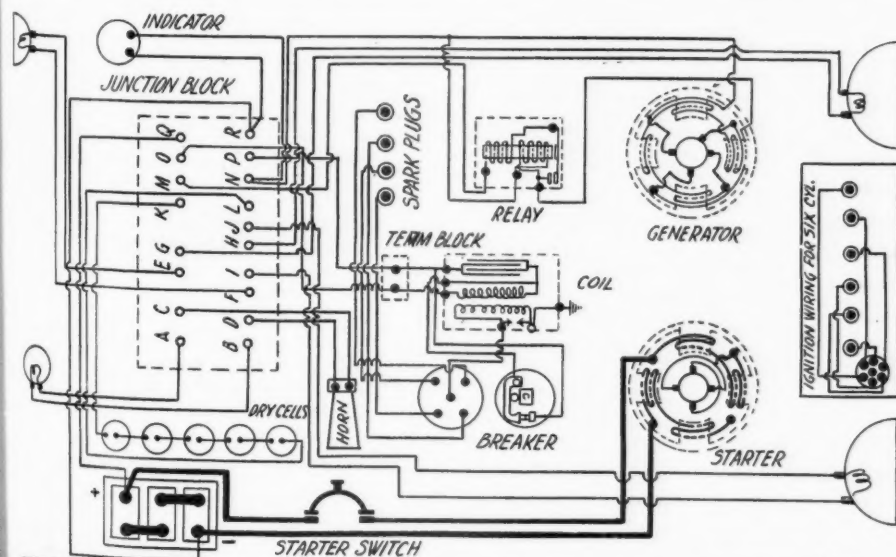
1—A clogged muffler and exhaust pipe will cause back pressure and accordingly reduce the power of the engine. The trouble probably occurs chiefly at the small holes in the muffler baffle plates. When the accumulation is sufficient to be noticed in the operation of the engine, the muffler should be either cleaned or replaced. Some mufflers cannot be taken apart and it is better to replace them.

Breaking In New Car

2—State the best method you know of for breaking a car in, and exactly how it should be done.—W. J. H., St. Mary's, W. Va.

2—The usual instruction is to drive slowly and carefully, keeping the speeds below 20 or 25 m.p.h. Another method which works in conjunction with the first is to put about a quart of lubricating oil into the gasoline tank with 5 gallons of gasoline. The lubrication is thus carried through the carburetor up into the combustion chamber where it assists in lubricating the cylinder walls. This method, combined with careful driving, should allow the engine to work in nicely. It has the slight disadvantage of causing a heavy accumulation of carbon in the combustion chamber and after 500 or 600 miles this must be cleaned out. After the first 500 miles the oil treatment in the gasoline should be discontinued.

Wiring Diagram of 1915 Four-Cylinder Studebaker



STUDEBAKER MODEL SD-4 AND EC-6 (1915) WAGNER STARTING AND LIGHTING SYSTEM REMY IGNITION

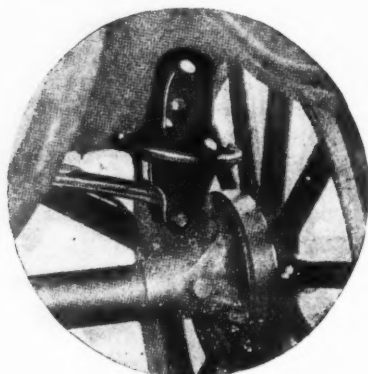
Q—Give wiring diagram for 1915 four cylinder Studebaker touring car.—H. L. Kirchhoff, Chicago, Ill.

Diagram is shown in accordance with your request.

BOOSTING ACCESSORY SALES

IF you are not cashing in heavily on accessory sales now, you probably never will. All of the cars that have been "laid up" during the winter are out on duty now and every one of them need something new in the way of accessories which you can sell to them. The new cars, too, are always likely prospects for bumpers, a tire, a windshield visor, wing or something.

Seasonable merchandise—luggage carriers and the like—should sell very well at this time, especially to the tourist, who is going to take some long trips in the summer. Find out who the people are in your territory who are going to make trips this year and sell them the accessories that they will need. Your place of business should be the headquarters, and your name a by-word of the motor tourist.

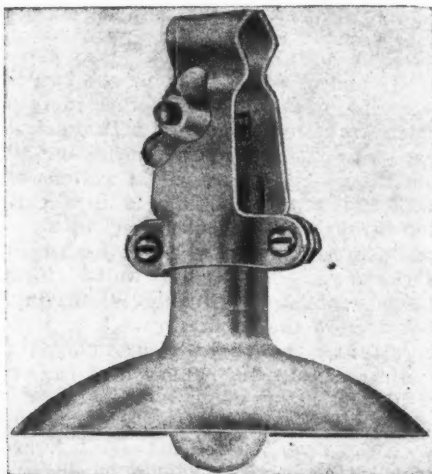


Aerobelle shock absorber

The Aerobelle Shock Absorber for Ford cars is the product of the Aerobelle Co., Worcester, Mass. The cut shows the Aerobelle attached to the rear spring of the Ford.

The American Forging & Socket Co., Pontiac, Mich. has placed on the market the Pontiac Windshield Top Support for Fords, a cut of which is reproduced on this page. It replaces the old strap attachment for the front of the Ford top with the rod shown.

The Woster Motor Lamp is the product of the Worcester Electric Supply Co.,



Woster motor lamp

68 High street, Worcester, Mass. It is designed for use under the hood and attaches to the radiator brace rod under the hood. The lamp bracket is adjustable so it will slide along the brace rod. It can be removed and used as a trouble lamp. The price is \$1.75.

Globe Standard Products Co., 39 S. State street, Chicago, is the maker of the Checker cushion, an all-leather accessory to comfortable driving. The Checker cushion is designed for use at the driver's back or for the passenger.

The Trusko Brace for Fords is a device designed to overcome troubles caused by vibration. By supporting the crank case and drive shaft, it allows road shocks, otherwise delivered against parts of the mechanism, to be distributed over the entire frame.

It also serves as a brace, for the frame and supports the radius rods. By providing a strong supporting unit, it prevents sidesway due to engine momentum, and protects the power plant and transmission against longitudinal thrusts.

Models are made both for passenger cars and trucks. Retail price \$2.00 The Trusko Brace is manufactured by The Trusko, Inc., Napa, California.



Pontiac windshield top support for Fords

The Glide Spring Company, General Motors Bldg., Detroit, is now marketing an ultra-flexible, double goose-neck front spring for Ford cars. This has an added length of twelve inches; has eight leaves instead of the usual seven. The main leaf is vanadium. There are no extra parts or special fittings. The list price is \$6.50.

The Lincoln Shock Absorber absorbs the shock created by the release of the downward pressure of the spring, after the spring has been compressed by the original shock. It works with and completes the spring function and changes

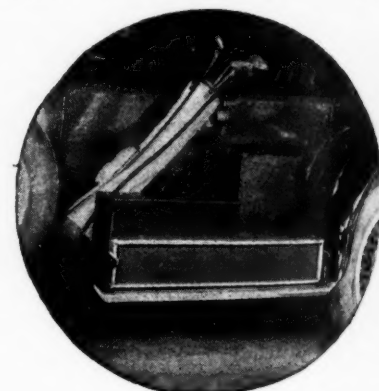


Lincoln shock absorber

the jolts into an easy wave-like motion. Lincoln Products Co., 1253 Michigan avenue, Chicago, are the manufacturers.

The Bethlehem Spark Plug Co. Inc., Bethlehem, Pa., has just perfected a luggage-carrier which it calls the "Tourack." This is a solid-sided, substantial luggage-carrier that will accommodate anything from a handbag to a trunk.

The Tourack might be described as an extra running-board which fastens to the regular running-board of the car, with two adjustable brackets. It runs the entire length of the car's step and folds flat when not in use. The solid side is topped with water-proof linoleum and beaded with neatly mitred strips of



Tourack

aluminum. The brackets are copper-oxydized arms with ball-and-hole check and thumbscrews for locking at any angle.

When not in use as a luggage-carrier, the Tourack lies flat against the running-board; in fact, it serves as a running-board, or step, when in this position. From flat, or horizontal, it opens up to vertical for the reception of suit-cases, bags, etc. From vertical it can be swung out to horizontal again for carrying trunks, large boxes and the like.

BOOSTING ACCESSORY SALES

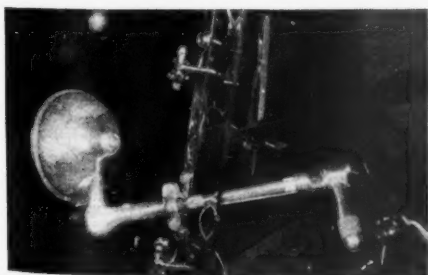
The Auto Specialties Co., St. Joseph, Mich., announces a change in the name of its Drednaut shock absorbers. The new name for this accessory is Drednaut Equalizers.

The Travel-On is an emergency gasoline container. It holds one gallon of gas and can be carried in a convenient place in the car. With it, it is easy to remove a gallon of gas from the tank of another car when an emergency arises. It is for sale by the Travel-On Sales Co., Baltimore, Md.



Travel-On

One of the recent additions to the accessory field is the Lorraine Controllable Driving Light. It derives its name from the fact that the light can be turned to every conceivable position, forward, backward, up or down. This is controlled by a handle which, in turn, is connected to a set of bevel gears and helical gears incased in a housing packed with lubricant. The reduction in



Lorraine controllable driving light

the gears makes possible a quick turning of the lamp with but a slight manipulation of the handle. It is made for both open and enclosed models. There is a quick focusing device in the back of the lamp and the switch is located in the end of the horizontal shaft. The price ranges from \$43.50 for the silver-plated open car model shown, to \$35, the price for the black-and-silver model for enclosed cars. The light is marketed by the Lorraine Corp., Chicago, Ill.

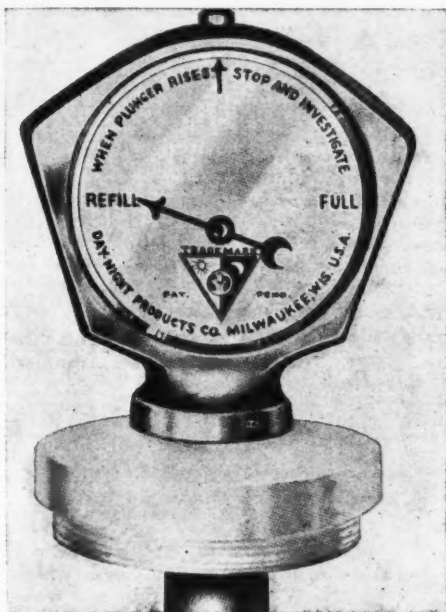
The Stone Mfg. Co., 1502 Michigan



Stone campfire cooker

avenue, Chicago, recently announced the Stone Campfire Cooker, a cut of which is reproduced on this page. This cooker consists of an iron stake, the lower half of which is to be driven into the earth right in the center of the fire. The upper half is notched so that the cooking grids or shelves and the coffee pot hook, which is a part of the outfit, may be fastened to it.

The Day-Night Meter is made by the Day-Night Products Co., 600 S. Pierce street, Milwaukee, Wis. It registers the water level in the radiator by means of the dial, as shown in the cut. It also warns the driver against freezing and overheating. The price is \$6.



Day-Night meter

The Auto Model Safety Ash Tray is the product of the Universal Safety Ash Tray Co., Providence, R. I. The cut shows the cigarette extinguisher and the ash receptacle. It can be attached to any make or model of car. It is priced by the manufacturer at \$15 a dozen.

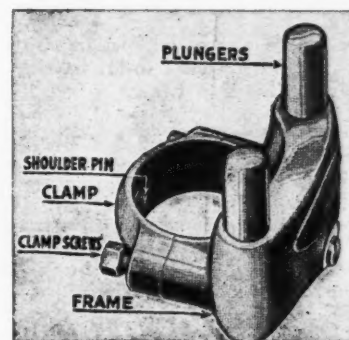
Lupton, Hill & Lupton, Dayton, O., announce the GLB Protector for generator, lights and batteries. It acts as a regulator for the battery, a safety device against burning out of lights and also shows defects in charging line, cut-out or ammeter. The price is \$2.50.



Auto model safety ash tray

The Mosler Spit Fire Spark Plug is made in all sizes for all cars and trucks by the Mosler Metal Products Corp., Mt. Vernon, N. Y. The Ford size sells at 60 cents, other sizes sell at \$1.

The preferred Auto Lock, shown in the cut on this page, is made by the Lampman Tool Co., Angola, Ind. The lock is attached under the steering wheel and when locked, two plungers firmly hold the steering wheel between them.



Preferred auto lock

The Mohawk Three Speed Sliding Gear Transmission for Ford cars and trucks is made by the Mohawk Mfg. Co., Peoria, Ill. This transmission is a complete unit, ready to install in a Ford car or truck.

The Wells Mfg. Co., Fond du Lac, Wisconsin, announces the Wells High Tension Distributor for use on Ford cars and trucks.

The Burnley Battery & Mfg. Co., Northeast, Pa., announces the Burnley Radiator Cement.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Hagerstown, Md.	Automobile Show	April 23-25
Red Bank, N. J.	Eighth Annual Show	May 7-12
Green Bay, Wis.	Annual Automobile Show	Aug. 27-30
Sacramento	Annual Automobile Show	Sept. 3-8
Memphis	Annual Automobile Show	Sept. 28-30
Fresno, Calif.	Automobile Show	Sept. 28-Oct. 5
Little Rock, Ark.	Annual Automobile Show	Oct. 8-13
Dallas, Texas	Annual Fall Show	Oct. 13-18
Waco, Texas	Waco Automobile Dealers' Assn.	Oct. 20-Nov. 5
New York	Salon at the Hotel Astor	Nov. 4-10

RACES

Indianapolis	Annual 500 Mile International Sweepstakes	May 30
Tours, France	Grand Prix 500 Mile Race	July 2

CONVENTIONS

New York	National Highway Traffic Association, Automobile Club of America	May 10
Detroit	Spring Convention of Service Managers' Division of National Automobile Chamber of Commerce	May 15-16
Spring Lake, N. J.	Summer Meeting of the Society of Automotive Engineers	June 19-23
Chicago	National Conference of Trade Association Secretaries and Managers under the auspices of the National Automobile Dealers' Assn.	July 23-24
Dixville Notch, N. H.	Summer Meeting of the Automotive Equipment Association	June 25-July 1
Olympia, Wash.	Convention Washington Automotive Trade Association	July
Mobile, Ala.	Semi-Annual Meeting of the Alabama Automotive Trades Association	July 23
Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17

SQUEEKS & RATTLES

If You Know Any, Tell Them to Us

Spring Fever

Oh, for a lazy, shady spot, beside a warbling brook,
A rod and reel, that easy feel, an Oliver Curwood book.
An old black pipe, cornfields ripe and nothing to worry about,
No noise, no jar, a motor car, oh, 'I let's run right out.
—Lew Brication.

Or, Shove the Piano Around

A reader suggests that, if we are short of Squeeks we might collect some from an old Flivver or, a new pair of shoes.

In memoriam

Here lies

IMA SPEEDER

He wanted to see if his car would beat the train to the crossing.

IT WAS A TIE

May he rest peacefully

Fable

Once there was a car owner who did not expect the battery man to install his mail order battery free of charge or furnish free air for his gyp tires.

—K. R. F.

Lew Brication, Editor,
Squeeks & Rattles.

Dear Lew:

Your cry for squeeks and rattles has kindered in me, a fire, to do my bit but there are a lot of birds like myself, wishing to contribute but for lack of brains, we are unable to do so in the capacity required. Therefore, I urge you, in behalf of those like myself to give space to "The Worst Boner I Ever Pulled" and you will hear from a lot of boneheads not otherwise able to make Squeeks & Rattles.

—BONEHEAD.
(Name copyrighted.)

Don't be too harsh with us, Bonehead. However, if you will tell us about the worst boner you ever pulled, we'll confess ours and then I think everyone will come in.

—LEW.

"Flivvers Common Now in Palestine"

—Headline.

So are palm trees in Iceland.

She—I say, Arthur, where do all those bursted tires go to in the end?

Arthur—I don't know, but if they go where most people consign them, there must be a terrible smell of burning rubber somewhere.—Doc Hayward.

Much the Same

Motorist (pulling up)—What's the matter; didn't you hear me blow my horn?

Pedestrian—Yes, but there's so much hay fever about, I didn't think it was an automobile.—Peoria Transcript.

A Howl for Help—No. 2

Now all you guys that ain't comin' through and sendin' us some stuff for this here page, you'd better get busy and start burnin' 'em up or the first thing you know you won't know anything.

Favorite Agonies

My favorite agony is the guy who calls me out ten miles to tow in his car when he runs out of gas in front of a filling station.

—G. Pat.

He'll Learn

Helper to mechanic: "I can't get this nut loose."

Mechanic: "Don't feel discouraged—they're the money-makers."—V. C. Stoltenberg.

Tale of a Bum Garageman

Shop
Slop
Hock
Stop

"Blue Law Bill Introduced for Illinois"—headline.

All right, go ahead. Pretty soon, Russia will have to put restrictions on immigration because so many Americans will be coming in to enjoy the liberties.

Dumbbells I Have Met

The guy who backs out of the garage with a portable jack under the front wheels.

—Wolf Point.

Movie of a Busy Office

Guy reading time table.

Ditto reading sporting goods catalogue.

What About an Instruction Book?

"Mr. and Mrs. Ernest Ford are the proud parents of a nine pound Ford, which arrived a few days ago. It arrived in fine condition and was accepted at once. It has all the attachments that the other Fords have. Oh, yes, the tonneau is all upholstered in bear skins, and guaranteed to be strictly waterproof."—Falls City (Neb.) Daily News.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Ace.....30	1 1/2	\$2550	Mi-412	3 1/2x5	B-L	B-L	Ti-6560	WO.	34x3 1/2	34x5 1/2
Ace.....40	2 1/2	3100†	Mi-402	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO.	36x4 1/2	36x7 1/2
Ace.....60	3	3700†	Mi-402	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Ace.....20	1 1/2		Co-N	3 1/2x5	B&B	Cot.	Ti-6250	WO.	35x5 1/2	35x5 1/2
Acme.....30	1 1/2		Co-N	3 1/2x5	B&B	Cot.	Ti-6352	WO.	34x3 1/2	34x5
Acme.....40	2 1/2		Co-L4	4 1/2x5 1/2	B&B	Cot.	Ti-6460	WO.	36x4	36x7
Acme.....60	3		Co-L4	4 1/2x5 1/2	B&B	Cot.	Ti-6660	WO.	36x5	40x10
Acme.....90	3 1/2		Co-B5	4 1/2x6	B&B	Cot.	Ti-6760	WO.	36x6	40x12
Acme.....125	5-6 1/2		Co-B5	4 1/2x6	Own.	Own.	Own.	WO.	36x5	36x5
Amer. La France	3 1/2	4950	Own.	4 1/2x6	Own.	Own.	Own.	WO.	36x6	40x6
Amer. La France	5	5500	Own.	4 1/2x6	Own.	Own.	Own.	WO.	36x6	40x6
Armleder.....20	1 1/2		Bu-CTU	3 1/2x5 1/2	Ful.	Ful.	Ti-6460	WO.	34x3 1/2	34x5 1/2
Armleder.....HVB	2 1/2		Bu-HTU	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4 1/2	36x7 1/2
Armleder.....HWC	2 1/2		Co-C4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4 1/2	36x7 1/2
Armleder.....KWB	3 1/2		Bu-YTU	4 1/2x6	B-L	B-L	Ti-6660	WO.	36x5 1/2	36x5 1/2
Armleder.....KWC	3 1/2		Co-E4	4 1/2x5 1/2	M&E	Own.	Own.	WO.	34x4 1/2	34x5 1/2
Atlas.....22	1	1495	Bu.....	3 1/2x5 1/2	M&E	Own.	Own.	WO.	36x6	36x6
Atlas.....44	1 1/2-2	1950	Co-J4	3 1/2x5	Ful.	Ful.	Ti-6460	WO.	34x4 1/2	34x5 1/2
Atterbury.....20	1 1/2	2175	Co-J4	3 1/2x5	Ful.	Ful.	Ti-6560	WO.	36x4 1/2	36x4 1/2
Atterbury.....22C	2 1/2	3375b	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO.	36x5	40x6
Atterbury.....22D	3 1/2-4	4275b	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6760	WO.	36x6	40x7
Atterbury.....22E	5-6	4975b	Co-B2	4 1/2x6	B-L	B-L	DR.	34x4	34x6	36x8
Autocar.....21	1 1/2-2	2200†	Own.	4 1/2x5 1/2	Own.	Own.	Own.	DR.	34x4	36x8
Autocar.....27	2-3	3100†	Own.	4 1/2x5 1/2	Own.	Own.	Own.	DR.	34x6	36x12
Autocar.....26	4-6	4200†	Own.	4 1/2x5 1/2	Own.	Own.	Own.	DR.	36x3 1/2	36x5
Available.....HJ	1 1/2	2450	Ho-O3	4x5	B-L	B-L	Ti-6460	WO.	36x3 1/2	36x5
Available.....HJ	1 1/2	3160	Ho-CU3	4x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	40x5d
Available.....HJ	1 1/2	4175	Ho-MU3	4x5 1/2	B-L	B-L	Ti-6660	WO.	36x5	40x5d
Available.....H5	3	5375	Ho-T3	5x6	B-L	B-L	Ti-6760	WO.	36x6	40x12
Available.....H5	3		Own.	3x4	Own.	Own.	To-0X2	IG.	34x5n	34x5n
Bessemer.....G1		1450	Co-N	3 1/2x5	Ful.	Ful.	To-A	IG.	35x5n	35x5n
Bessemer.....H2	1 1/2	1995	Co-N	3 1/2x5	B&B	Bak.	LM-7150	DR.	36x3 1/2	36x5
Bessemer.....J2	2 1/2	2805	Co-C2	4 1/2x5 1/2	B&B	B-L	LM-7250	DR.	36x4	36x4d
Bessemer.....K2	4	3495	Co-E7	4 1/2x5 1/2	B&B	B-L	To-E	IG.	36x5	36x10
Bethlehem.....KN1	1	1385	Own.	3 1/2x5	B&B	Det.	Ea-3070	SB.	35x5n	35x5n
Bethlehem.....GN2	2	2185	Own.	4x5 1/2	B&B	Det.	Wi-60A	DR.	34x4	34x6
Bethlehem.....HN3	3	2985	Own.	4x5 1/2	Ful.	Ful.	Wi-88E	DR.	36x4	36x6
Brookway.....E2	1		Wi-SU	4x5	B-L	B-L	Co-52001	SB.	33x5n	33x5n
Brookway.....S	1 1/2		Wi-SU	4x5	B-L	B-L	Ti-6460	WO.	36x4	36x8
Brookway.....K2	2 1/2		Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Brookway.....R3	3 1/2		Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO.	36x5	36x5d
Brookway.....T5	5		Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	40x7d
Buick.....23-4-SD	3 1/2	945	Own.	3 1/2x4 1/2	Own.	Own.	Own.	SB.	31x4n	31x4n
Case.....TR	2		Own.	4 1/2x5 1/2	TD.	Own.	To-C139	IG.	36x6n	38x7n
Chevrolet.....G	3 1/2	650	Own.	3 1/2x4	Own.	Mun.	Own.	SB.	31x4n	31x4 1/2d
Chevrolet.....T1		1095	Own.	3 1/2x5 1/2	Own.	Mun.	Own.	WO.	33x4n	35x5n
Clydesdale.....10		1485	Co-N	3 1/2x5	B&B	B-L	Ti-5511	SB.	34x5n	34x5n
Clydesdale.....8		2650	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO.	36x4	36x7
Clydesdale.....6		3350	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x5	36x5d
Clydesdale.....4		4300	Co-B5	4 1/2x6	B-L	B-L	Ti-6660	WO.	36x6	40x6d
Clydesdale.....2		4750	Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x7	40x7d
Commerce.....9	3 1/2		Co-N	3 1/2x5	Det.	Det.	Sa-D16	SB.	32x4 1/2	32x4 1/2n
Commerce.....14	1 1/2		Co-J4	3 1/2x5	B-L	B-L	WO.	36x3 1/2	36x5	36x5
Commerce.....25	2 1/2		Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4 1/2	36x7 1/2
Corbitt.....S	3 1/2	1250	HS-700	3 1/2x5	B-L	B-L	Sh-100	WO.	31x4 1/2	31x4 1/2n
Corbitt.....E1		1480	Co-N	3 1/2x5	B-L	B-L	Sh-100	WO.	34x3 1/2	34x4 1/2
Corbitt.....D1 1/2		2200	Co-J4	3 1/2x5	B-L	B-L	Sh-150	WO.	34x3 1/2	34x5 1/2
Corbitt.....C2		2600	Co-K4	4 1/2x5 1/2	B-L	B-L	Sh-103	WO.	36x3 1/2	36x7 1/2
Corbitt.....B2 1/2		3000	Co-K4	4 1/2x5 1/2	B-L	B-L	Sh-21	WO.	36x4 1/2	36x8
Day-Elder.....AN	1 1/2		Bu-WTU	3 1/2x5 1/2	B-L	B-L	Ti-6352	WO.	34x3 1/2	34x4
Day-Elder.....BN2			Co-J4	3 1/2x5	B-L	B-L	Ti-6460	WO.	31x3 1/2	34x5
Day-Elder.....DN2 1/2			Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x7
Day-Elder.....CN3			Bu-HTU	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Day-Elder.....FN1			Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6660	WO.	36x5	36x5d
Day-Elder.....EN5-6			Bu-YTU	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x5	40x6d
Dearborn.....E1		1600†	Bu-Mu	3 1/2x5 1/2	Ful.	Ful.	Wi.....	WO.	35x5n	35x5n
Dearborn.....F1 1/2		1980†	Bu-WU	3 1/2x5 1/2	Ful.	Ful.	Wi.....	WO.	34x4	34x5
Dearborn.....482		2390	Bu-WU	3 1/2x5 1/2	Ful.	Ful.	Wi.....	WO.	34x4 1/2	34x7
Defiance.....G1		1525	Co-N	3 1/2x5	B&B	G-L	Ea-1000	SB.	35x5n	35x5n
Denby.....31 1/2-1 1/4		1485	Co-N	3 1/2x5	Ful.	Ful.	Cl-B300*	SB.	34x5n	34x5n
Denby.....332		2375	Co-J4	3 1/2x5	Ful.	Ful.	Cl-ID	IG.	35x5n	38x7n
Denby.....353		2975	Co-J4	3 1/2x5	Ful.	Ful.	Cl-2D	IG.	36x4	36x7
Denby.....27 1/2		3695	Co-K4	4 1/2x5 1/2	Ful.	Ful.	Cl-3D	IG.	36x5	36x5d
Denby.....2105		4295	Co-L4	4 1/2x5 1/2	Ful.	Ful.	Cl-5D	IG.	36x6	40x6d
Dependable.....CD	1 1/2-2	2350	Bu-CTU	3 1/2x5 1/2	Ful.	Ful.	Wi-800J	WO.	34x5	36x8
Dependable.....EG	2 1/2-3	2950	Bu-ETU	4 1/2x5 1/2	Ful.	Ful.	Wi-900C	WO.	36x5	36x10
Diamond T.....O3	1-1 1/4	1975	Hi-700	3 1/2x5 1/2	Cov.	Cov.	Own.	WO.	36x3 1/2	36x4
Diamond T.....T1 1/2		2250	Hi-700	3 1/2x5 1/2	Cov.	Cov.	Ti-6160	WO.	36x3 1/2	36x5
Diamond T.....U2	2 1/2	2650	Hi-1400	4 1/2x5 1/2	Cov.	Cov.	Ti-6560	WO.	36x4 1/2	36x8 1/2
Diamond T.....K5	3 1/2	3750	Hi-1500	4 1/2x5 1/2	Cov.	Cov.	Ti-6660	WO.	36x5	36x5d
Diamond T.....EL5		4325	Hi-200	4 1/2x5 1/2	Cov.	Cov.	Ti-6760	WO.	36x6	40x6d
Diamond T.....S5		4500	Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	40x6d
Dodge Brothers.....3 1/2		750	Own.	3 1/2x4 1/2	Own.	Own.	Own.	SB.	32x4n	32x4n
Dorris.....K-4	2 1/2	3400	Own.	4 1/2x5 1/2	Own.	War.	Ti-6560	WO.	36x4	36x7
Dorris.....K-7	3 1/2	4400	Own.	4 1/2x5 1/2	Own.	War.	Ti-6660	WO.	36x7	36x10
Dart.....109		655b	Ly-K	3 1/2x5	Del.	Del.	Fl-105	SB.	31x4n	31x4n
Double Dr.....DFT3		4000	Bu-ETU	4 1/2x5 1/2	B&B	Own.	Own.	WO.	36x6	36x6
Duplex.....A2		2775	Hi-400	4x5 1/2	Cov.	Cov.	Sh-103	WO.	35x5n	38x7n

* Make Optional
† Short wheelbase model
‡ 6 cylinders
§ All 4 cyl. engines unless otherwise specified
|| Truck Tractor
b-price includes body or cab
d-dual
k-pneumatic tires optional at extra cost
n-pneumatic tires standard

ENGINE:
Bu-Buda
Co-Continental
De-Dodge
He-Hercules
Hi-Hinkley
HS-Herschell-Spillman
Ly-Lycoming
Mi-Midwest
Wa-Waikesley
We-Weideley
Wi-Wisconsin

CLUTCH & GEARSET
H&B-Borg & Beck
B-L-Brown-Lipe
Bak-Baker
Cam-Campbell
Cot-Cotta
Cov-Covert
Det-Detlaft
Del-Detroit
Ful-Fuller
H-S-Hole-Shaw
Hoo-Hoosier
M&E-Merchant & Evans

Mec-Mechanics
Mun-Muncie
T.D.-Twin Disc
War-Warner
REAR AXLE:
Am-American
Cl-Clark
Co-Columbia
Du-Durston
Ea-Eaton
Fl-Fliht
LM-L-M

Ru-Russell
Sa-Salisbury
Sh-Sheldon
Ti-Timken
To-Torbenen
Wa-Walker
Wi-Wisconsin
Ch-Chain
DR-Double Reduction
IG-Internal Gear
SH-Spiral Bevel
SP-Straight Bevel
WO-Worm

(This list comprises trucks distributed on a national basis)

[illegible]

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear				Make & Model	Final Drive			Front	Rear		
Walter.....N2	2	\$3600†	Ow...	4x5½	B-L.	B-L.	Ow...	DR.	36x4	36x8											
Walter.....S5	5	5100†	Ow...	4½x6½	B-L.	War.	Ow...	DR.	36x6	40x6d											
White.....15 ¾	¾	2400	Ow...	3½x5½	Ow.	Ow.	Ow...	SP.	34x5n	34x5n											
White.....20 ½	½	3250	Ow...	3½x5½	Ow.	Ow.	Ow...	DR.	36x4	36x7d											
White.....40 ¾	¾	4200	Ow...	4½x5½	Ow.	Ow.	Ow...	DR.	36x5	40x5d											
White.....45 ½	½	4500	Ow...	4½x5½	Ow.	Ow.	Ow...	DR.	36x6	40x6d											
Wilson.....AA1	1	1900	Bu-CTU	3½x5½	B-L.	B-L.	Ru-3600	SP.	35x5	35x5											
Wilson.....BB1 ½	½	2550	Ow...	4½x5	B&B.	Ow.	Wa-2A.	DR.	36x6k	38x7k											
Wilson.....CC2 ½	½	3050	Ow...	4½x5	B&B.	Ow.	Wa-25A.	DR.	36x6k	40x8k											
Wilson.....EE3 ½	½	3950	Bu-YTU	4½x6	M&E	Ow.	Wa-5A.	DR.	36x5	36x10											
Wilson.....F5	5	4350	Bu-ATU	4½x6½	M&E	Ow.	Wa-5A.	DR.	36x5	40x5											
Wilson.....F1 ½	½	2270†	Co-J4.	3½x5	B&B.	Cot.	Ti-6460.	WO.	36x3½	36x5k											
Wilson.....EA2 ½	½	2825†	Co-K4.	4½x5½	B&B.	Cot.	Ti-6560.	WO.	36x4k	36x7k											
Wilson.....G2 ½	½	3685†	Co-L4.	4½x5½	B&B.	Cot.	Ti-6660.	WO.	36x5k	36x5dk											
Wilson.....H5	5	4520†	Co-B2.	4½x6	B&B.	Cot.	Ti-6752.	WO.	36x6k	40x6dk											
Yellow Cab. M22	¾	1590	Co-V4.	3½x5	B-L.	B-L.	Ti-6752.	SB.	33x4½	33x4½											
Yellow Cab. M42	1 ¼	1640	Co-V4.	3½x5	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n											

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear				Make & Model	Final Drive			Front	Rear		
CANADIAN																					
Gotfredson.....20 ¾-1	¾-1	\$1685	Bu-WTU	3½x5½	B-L.	B-L.	Ti-6250.	WO.	34x5n	34x5n											
Gotfredson.....40 1½-2	1½-2	2300	Bu-GTU	4x5½	B-L.	B-L.	Ti-6460.	WO.	36x6n	38x7n											
Gotfredson.....50 2½	2½	3000	Bu-EU.	4½x6	B-L.	B-L.	Ti-6560.	WO.	36x4	36x8											
Gotfredson.....80 4	4	3975	Bu-YTU	4½x6	B-L.	B-L.	Ti-6666.	WO.	34x5	36x12											
Gotfredson.....100 5	5	4800	Bu-BTU	5x6½	B-L.	B-L.	Ti-6760.	WO.	36x6	40x11											
Mapleleaf.....1½	1½	3000	Hi-300.	3½x5½	Ful.	Ful.	Sh-1501.	WO.	34x5n	36x6n											
Mapleleaf.....AA2	2	3600	Hi-400.	4x5½	Ful.	Ful.	Sh-103.	WO.	36x4	36x7											
Mapleleaf.....BB3	3	4050	Hi-500.	4½x5½	Ful.	Ful.	Sh-21.	WO.	36x4	36x4d											
Mapleleaf.....CC4	4	4800	Hi-200.	4½x5½	Ful.	Ful.	Sh-31.	WO.	36x5	36x5d											
Mapleleaf.....DD5	5	5625	Hi-1600.	4½x6½	Ful.	Ful.	Sh-51.	WO.	36x6	36x6d											
National.....FA1	1	2699	Wa-BUX	3½x5½	B-L.	B-L.	Ti-6352.	WO.	35x5n	35x5n											
National.....GA1 ½	1½	3699	Wa-BUX	3½x5½	B-L.	B-L.	Ti-6460.	WO.	34x4k	34x5k											
National.....HD2 ½	2½	4200	Wa-CU.	4½x5½	H-S.	B-L.	Ti-6560.	WO.	36x4	36x8											
National.....NB3 ¾	¾	4200	Wa-DU.	4½x6½	H-S.	B-L.	Ti-6666.	WO.	36x5	10x10											
National.....OA5	5	5395	Wa-EU.	5x6½	H-S.	B-L.	Ti-6760.	WO.	36x6	10x12											
Veteran.....M1 ½	1½	2699	Bu-CTU	3½x5½	B&B.	Cot.	Sh-1501.	WO.	34x5n	34x5n											
Veteran.....P2	2	3699	Bu-HTU	4½x5½	B&B.	Cot.	Sh.	WO.	36x4	36x7											
Veteran.....R3	3	4200	Bu-HTU	4½x5½	B&B.	Cot.	Sh-21.	WO.	36x4	36x7											
Veteran.....S4	4	5395	Bu-YTU	4½x6	B&B.	Cot.	Sh-31.	WO.	36x5	36x10											

CANADIAN

Gotfredson.....20 ¾-1	\$1685	Bu-WTU	3½x5½	B-L.	B-L.	Ti-6250	WO.	34x5n	34x5n
Gotfredson.....40 1½-2	2300	Bu-CTU	4½x6½	B-L.	B-L.	Ti-6460	WO.	36x4	38x7n
Gotfredson.....50 2½-3	3000	Bu-Etu	4½x6½	B-L.	B-L.	Ti-6560	WO.	36x4	38x8
Gotfredson.....80 4½-5	3975	Bu-YTU	4½x6½	B-L.	B-L.	Ti-6660	WO.	34x5	36x12
Gotfredson.....100 5½-6	4800	Bu-BTU	5x6½	B-L.	B-L.	Ti-6760	WO.	36x6	40x14
Mapleleaf.....1½	3000	Hi-300	3½x5½	Ful.	Ful.	Sh-1501	WO.	34x5n	36x6n
Mapleleaf.....AA2	3600	Hi-400	4½x6½	Ful.	Ful.	Sh-105	WO.	36x4	36x7
Mapleleaf.....BB3	4050	Hi-500	4½x6½	Ful.	Ful.	Sh-21	WO.	36x4	36x4d
Mapleleaf.....CC4	4800	Hi-600	4½x6½	Ful.	Ful.	Sh-31	WO.	36x5	36x5d
Mapleleaf.....DD5	5625	Hi-1600	4½x6½	Ful.	Ful.	Sh-51	WO.	36x6	36x6d
National.....FA1	2699	Wa-BUX	3½x5½	B-L.	B-L.	Ti-6352	WO.	35x5n	35x5n
National.....GA2	3699	Wa-BUX	4½x6½	B-L.	B-L.	Ti-6460	WO.	34x4k	34x5k
National.....HA3	4200	Wa-CU	4½x6½	H-S.	B-L.	Ti-6560	WO.	36x4	36x8
National.....IB4	4800	Wa-DU	4½x6½	H-S.	B-L.	Ti-6660	WO.	36x5	10x12
National.....JC5	5395	Wa-EU	5x6½	H-S.	B-L.	Ti-6760	WO.	36x6	10x12
Veteran.....M1 ½	2699	Bu-CTU	3½x5½	B&B.	Cot.	Sh-1501	WO.	34x5n	34x5n
Veteran.....P2	3699	Bu-HTU	4½x6½	B&B.	Cot.	Sh-21	WO.	36x4	36x7
Veteran.....R3	4200	Bu-HTU	4½x6½	B&B.	Cot.	Sh-31	WO.	36x4	36x7
Veteran.....S4	5395	Bu-YTU	4½x6½	B&B.	Cot.	Sh-51	WO.	36x5	36x10

Current Tractor Specifications

MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plows	Price	ENGINE				Belt Pulley, Dia. & Face (Ins.)	Weight (Lbs.)	TRACTION MEMBERS			MAKE & MODEL	Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plows	Price	ENGINE				Belt Pulley, Dia. & Face (Ins.)	Weight (Lbs.)	TRACTION MEMBERS		
				Make	No. of Cyls. Bore & Stroke	Recom. Fuel	Recom. Fuel			Dimensions, Diameter & Face (Ins.)	Type Final Drive	Make					No. of Cyls. Bore & Stroke	Recom. Fuel	Recom. Fuel						
Allis-Chalmers...	6-12	1	\$295	LeR.	4-3½x4½	G.....	10 x 5½	2,500	48x 6	W		McCormick-Deering	10-20	2	\$785	Ow.	4-4½x5	GKD.	15½x 7	3,700	42x12	W			
Allis-Chalmers...	15-25	3	1185	Mid.	4-4½x5½	G.....	12½x 6½	4,700	46x12	W		McCormick-Deering	15-30	3	1250	Ow.	4-4½x6	GKD.	16½x 8	5,750	50x12	W			
Allis-Chalmers...	20-35	4	1885	Ow.	4-4½x6½	GK.....	13 x 7½	6,150	50x12	W		Minneapolis...	12-25	3		Ow.	4-4½x7			6,600	56x12	W			
Allwork.....D	20-38	4-5	1695	Ow.	4-5 x 7	KD.....	14 x 7½	6,500	48x14	W		Minneapolis...	17-30	3-4		Ow.	4-4½x7			6,400	54x12	W			
Allwork.....G	14-28	3	1495	Ow.	4-4½x6	KD.....	11 x 7	4,800	48x12	W		Minneapolis...	22-44	4-5		Ow.	4-6 x 7			12,410	62x20	W			
Allwork.....C	16-30	3	1293	Ow.	4-5 x 6	KD.....	13½x 7½	5,200	48x12	W		Minneapolis...	35-70	8-10		Ow.	4-7½x9			22,500	85x30	W			
Aultman-Taylor...	15-30	3-4	1900	Cl.	4-5 x 6½	GKD.....	20 x 8	7,800	70x12	W		Moline (Un.)...D3	9-8	2-3	725	Ow.	4-3½x5	G.....	9 x 6½	4,103	52x 8	W			
Aultman-Taylor...	22-45	4-6	3100	Ow.	4-5½x8	GKD.....	20 x 11	12,500	70x20	W		Moline (Orc.)...D	9-8	2-3	725	Ow.	4-3½x5	G.....	9 x 6½	3,893	44x 8	W			
Aultman-Taylor...	30-60	8-10	4400	Ow.	4-7 x 9	GKD.....	24 x 11	22,500	90x24	W		Monarch.....C	20-30	4	3,700	Bea.	4-4½x6	GK.....	16 x 8½	8,700	66x12	T			
Avery.....15	3-4			Ow.	4-4½x6	GKD.....	16 x 7½	4,750	50x12	W		Monarch.....E	25-40		4,200	Bea.	4-4½x6	GK.....		12,000	67x12	T			
Avery.....20-35	4-5			Ow.	4-4½x7	GKD.....	16 x 7½	7,500	60x16	W		Monarch.....F	35-60		5,500	Bea.	4-4½x6	GK.....		15,000	78x12	T			
Avery.....25-50	5-6			Ow.	4-6½x7	GKD.....	22 x 8½	12,500	69x20	W		Nichols-Shepard...	20-42	4-6	2,600	Ow.	2-8x10	GK.....	22 x 8	13,500	64x20	W			
Avery.....45-65	8-10			Ow.	4-7½x8	GKD.....	26 x 10	22,000	87½x24	W		Nichols-Shepard...	25-50	6-8	3,320	Ow.	2-9x12	GK.....	24 x 9	20,500	69x28	W			
Avery, Tr. Runner		3		Ow.	4-4 x 5½	GKD.....	12 x 6½	5,000	x 8½	T		Nichols-Shepard...	35-70	8-12	4,030	Ow.	2-10½x14	GK.....	30 x 12	30,000	73x32	W			
Avery, RoadRazer		3		Ow.	6-3 x 4	G.....	None.....	4,600	42x 6	W		Pioneer.....G	18-36	4		Ow.	4-5½x6	GK.....		6,500	60x18	W			
Bates (St. Mule) H	15-25	3		Mid.	4-4½x5½	G.....	12 x 8½	3,600	48x10	W		Pioneer.....C	10-20	3		Ow.	4-7 x 8	G.....	17½x15	24,000	96x24	W			
Bates (St. Mule) F	18-25	3		Mid.	4-4½x5½	G.....	12 x 8½	4,850	56x10	T		Rumely OilPull	12-20	3		Ow.	2-6 x 8	KD.....	19 x 7	6,882	51x12	W			
Bates (St. Mule) G	25-35	4		Mid.	4-4½x6½	G.....	12 x 8½	6,500	x 10	T		Rumely OilPull	16-30	4		Ow.	2-7 x 8½	KD.....	23 x 8½	9,600	56x16	W			
Bates (St. Mule) 40	30-40	4	4,250	Mid.	4-4½x6½	G.....	12 x 8½	8,500	64x12	T		Rumely OilPull	20-40	6		Ow.	2-8 x 10	KD.....	26 x 9	12,820	64x20	W			
Bear.....B	25-35	4		Ste.	4-4½x6½	G.....	12 x 9	5,500	64x12	T		Rumely OilPull	30-60	8-10		Ow.	2-10 x 12	KD.....	36 x 11	26,700	80x30	W			
Best.....30-20	4			Ow.	4-4½x6½	GKD.....	12 x 8	8,100	68x11½	T		Russell.....15-30	3-4			Cl.	4-5 x 6½	GK.....	12½x 7	6,000	56x14	W			
Best.....60-40	9			Ow.	4-6½x8½	GKD.....	16 x 10	18,500	89x20	T		Russell.....20-40	4-5			Cl.	4-5½x7	GK.....	12½x 8	7,900	60x16	W			
Bryan.....Steam	15-30	3	2,500	Ow.	2-4 x 5	KD.....	18 x 7	5,500	52x12	W		Russell.....30-60	8-10			Ow.	4-8 x 10	GKD.....	24 x 10	22,550	84x22	W			
Case.....12-20	3		1,095	Ow.	4-4½x5	GKD.....	14½x 6½	4,230	42x12	W		Shaw-Enochs (Gr.)	18-36	3-4	1,635	Bea.	4-4½x6	GK.....	12 x 8	7,100	60x12	W			
Case.....15-27	3-4		1,350	Ow.	4-4½x6	GKD.....	16 x 6½	6,600	52x14	W		Stinson.....4-E	18-36	3-4		Wau.	4-4½x6½	G.....	8 x 5	2,900	41x 9	W			
Case.....22-40	4-5		2,650	Ow.	4-5½x6½	GKD.....	16½x 8½	10,700	56x16	W		Topp-Stewart.....B	30-45	4		LeR.	4-3½x4½	G.....		7,800	42x12	W			
Case.....40-72	8-10		4,900	Ow.	4-7 x 8	GKD.....	19½x10½	21,200	72x20	W		Toro.....6-10	2		675	LeR.	4-3½x6½	G.....	8 x 5	2,900	41x 9	W			
Caterpillar, 2 Ton	15			Ow.	4-4 x 5½	G.....	11½x 6½	4,000																	
Caterpillar, 5 Ton	25			Ow.	4-4½x6½	G.....	12 x 8½	9,400																	
Caterpillar, 10 Ton	40			Ow.	4-6½x7	G.....	14 x 10½	19,500																	
Cletrac.....F	9-16	2	745	Ow.	4-3½x4½	GK.....	7 x 5	1,930	*42x 5½	T		Townsend.....15-30	3-4		800	Ow.	2-6½x7	GKD.....	18 x 7	4,500	48x12	W			
Cletrac.....W	12-20	2	1,345	Ow.	4-4 x 5½	GK.....	8 x 6	3,455	48x 8	T		Townsend.....25-50	4-8		2,500	Ow.	2-8½x10	GKD.....	22 x 10	11,500	60x24	W			
Eagle.....F	12-22	3		Ow.	2-7 x 8			5,850	48x12	W		Traylor.....6-12	1		500	LeR.	4-3½x4½	G.....	8 x 6	1,750	38x10	W			
Eagle.....H	16-30	4		Ow.	2-8 x 8			9,100	48x12	W		Twin City.....12-20	3		1,200	Ow.	4-4½x6	GKD.....	16 x 6½	5,000	50x12	W			
E-B.....AA	12-20	3		Ow.	4-4½x5	GK.....	12 x 6½	4,550	54x12	W		Twin City.....20-35	5		2,750	Ow.	4-5½x6½	GKD.....	21 x 8½	9,200	60x20	W			
E-B.....Q	12-20	3		Ow.	4-4½x5	GK.....	12 x 8	6,500	60x12	W		Twin City.....40-65	8		4,750	Ow.	4-7½x9	GKD.....	23 x 10½	24,000	84x24	W			
E-B.....16-32	4			Ow.	4-5½x7	GK.....	16 x 9	9,400	72x16	W		Uncle Sam.....C-20	12-20	2-3		900	Wei.	4-4 x 5½	GK.....	16 x 6	3,000	46x12	W		
Fagool.....19-12	2	1,175	Lyc.	4-3½x5	K.....			3,600	48x 8½	W		Uncle Sam.....B-19	20-30	3-4	1,535	Bea.	4-4½x6	GKD.....	11 x 9½	4,650	50x12	W			
Fordson.....18	2	395	Ow.	4-4 x 5	K.....	9½x 6½		2,543	42x12	W		Uncle Sam.....D-21	20-30	3-4	1,485	Bea.	4-4½x6	GKD.....	11 x 9½	4,600	50x12	W			
Frick.....A	12-20	2	1000	Erd.	4-4 x 6	GK.....	13 x 7	5,800	60x10	W		Wallis.....OK	15-27	3		Ow.	4-4½x5½	GKD.....	18½x 7	3,630	48x12	W			
Frick.....C	15-28	3	1600	Bea.	4-4½x6	GK.....	13 x 7	6,730	60x12	W		Waterloo Boy.....N	12-25	3		Ow.	2-6½x7	GKD.....	14 x 8	5,869	52x12	W			
Gray.....EU	22-40	4		Wau.	4-5 x 6½	G.....	10 x 8	6,900	54x54	Dr		Wetmore.....12-25	3		1,185	Wau.	4-4 x 5½	GK.....	12 x 7	2,900	46x10	W			
Hart-Parr.....20	20	2	845	Ow.	2-5½x6½	K.....	13 x 6½	3,973	46x10	W		Wisconsin.....16-30	3-4		1,170	Cl.	4-5 x 6½	GK.....	16 x 8	5,600	52x12	W			
Hart-Parr.....30	30	3	1065	Ow.	2-6½x7	K.....	14 x 8½	5,220	52x10	W		Wisconsin.....22-40	4-5		2,550	Cl.	4-5½x7	GK.....	16 x 9	7,500	52x12	W			
Hart-Parr.....(Road)	30	3	1395	Ow.	2-6½x7	K.....	14 x 8½	7,520	52x18	W		Yuba (Ball Tread)	15-25	3	2,750	Wis.	4-4½x6	D.....	12 x 6½	5,750	*36x12	T			
Heider.....D	9-16	2		Wau.	4-4½x5½	GK.....	12 x 6	4,000	54x 8	W		Yuba (Ball Tread)	25-40	6	4,250	Wis.	4-5½x7	D.....	12 x 8½	10,130	*48x17½	T			
Heider.....C	12-20	3		Wau.	4-4½x6½	GK.....	14 x 7	6,000	57x10	W															
Heider.....M	5-10			LeR.	4-3½x4½	G.....	8 x 5	2,800	46x 6	W															
Huber.....(Light 4)	12-25	3	985	Wau.	4-4½x5½	GK.....	13 x 7	5,000	60x10	W															
Huber.....(Super 4)	15-30	3		Mid.	4-4½x6	G.....	13 x 7	6,000	60x10	W															
LaCrosse.....M	6-12	1		Ow.	2-4 x 6			3,000	48x 7	W															
LaCrosse.....H	12-24	3		Ow.	2-6 x 7			3,800	56x10	W															
Lauson.....S	12-25	3		Mid.	4-4½x5½	GKD.....	15x	4,200		W															
Lauson.....T	15-30	4		Bea.	4-4½x6	GKD.....	16½x 4	6,200		W															
Leader.....B	12-18	2		Ow.	2-6½x6	GK.....	14 x 7	4,800	50x12	W															
Leader.....N	16-32	3-4		Cl.	4-5 x 6	GK.....	14 x 7½	5,800	52x12	W															
Leader.....GU	16-32	3-4		Cl.	4-5 x 6	GK.....	14 x 7½	*68x 9		W															
Lincoln.....A	15-30	3	1,600	Bud.	4-4½x6	GK.....	12 x 7	5,000	40x14	W															
Little Giant.....B	16-22	4		Ow.	4-4½x5	GK.....	10 x 7	5,200	54x14	W															
Little Giant.....A	26-35	6		Ow.	4-5½x6	GK.....	13½x9	8,700	68x20	W															
Lombard.....100	12-16			Ow.	6-5½x7			19,000	x12	W															
London.....12-25	3			Mid.	4-4½x5½			48x12		W															

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						WHEEL BASE (INS.)		TIRE SIZE (INS.)		NAME AND MODEL		ENGINE		ELECTRICAL SYSTEM		Clutch, Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE	
OPEN MODELS			CLOSED MODELS			Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	Make	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make	Type and Make				Gear Ratio	
2-3 Pass.	4-5 Pass.	6-7 Pass.	2-3 Pass.	4-5 Pass.	6-7 Pass.															
\$1950c	\$1785	\$1850	\$1835c	\$2250	\$2485	127	33x4 1/2	American.....D-66	H-S	6-3 1/2x5	29.40	Strom.	G-D	A-K	s-p	B&B	B & B	m Hartford	F Salis	4.50
	1650				1450d	127	33x4	American.....Steamer	2-	None	None	L-N	L-N	None	None	None	None	m Universal	1 1/2 F Salis	1.75
	1195				1595d	114	32x4	Anderson.....41	Cont.	6-3 1/2x4 1/2	23.44	Zenith	West.	West.	s-p	B&B	Durston	f Universal	1 1/2 F Salis	4.75
1495	1495	1505	1785b 1915c	1905c	1995d	122	32x4	Anderson.....Series 50	Cont.	6-3 3/4x4 1/2	27.34	Rayfield	Remy.	Remy.	s-p	B&B	Durston	f Universal	1 1/2 F Salis	4.62
	1535				2200	132	33x4	Anderson.....Series 50	Cont.	6-3 3/4x4 1/2	27.34	Rayfield	Remy.	Remy.	s-p	B&B	Durston	f Universal	1 1/2 F Salis	4.62
	2800	2900		3625	3750	120	32x4	Apperson.....6	Falls	6-3 3/4x4 1/2	23.44	Strom.	Remy.	Remy.	s-p	Rockford	Mech.	m Thieme	1 1/2 F Timk	4.00
	1275	1345	1995n	1965f	\$3850	130	33x5	Apperson.....8-23-S	Own.	8-3 1/2x5	33.80	Johnson	Bijur.	Remy.	m-d	Own	Own	m Thieme	1 1/2 F Own	4.25
	1095			1465		121	32x4	Auburn.....6-51	Cont.	6-3 3/4x4 1/2	27.34	Strom.	Remy.	Remy.	s-p	B&B	G-L	m Universal	1 1/2 F Salis	4.75
					1465	114	31x4	Auburn.....6-43	Cont.	6-3 3/4x4 1/2	23.44	Strom.	Remy.	Remy.	s-p	B&B	Warner	m Detroit	1 1/2 F Col.	4.60
						122	32x4 1/2	Auburn.....6-63	Weid.	6-3 1/2x5	25.35	Strom.	Remy.	Remy.	s-p	B&B	Warner	m Thieme	1 1/2 F Col.	4.60
	1395		1495d	1850		118	32x4	Barley.....	Cont.	6-3 3/4x4 1/2	23.44	Strom.	Delco	Delco	s-p	B&B	Fuller	f M&E	1 1/2 F Col.	4.58
				2250p																
805	885	725g		1175	1395	109	31x4	Buick.....1923-34-5-6-7-38	Own.	4-3 3/4x4 1/2	18.23	Marvel	Delco	Delco	m-d	Own	Own	m Own	1 1/2 F Own	4.66
	1175	975g		1935	1985	118	32x4	Buick.....1923-41-4-5-47	Own.	6-3 3/4x4 1/2	27.34	Marvel	Delco	Delco	m-d	Own	Own	m Own	F Own	4.10
		1435	1625a 1675c	1895	2195	124	33x4 1/2	Buick.....1923 48-9-50-4-55	Own.	6-3 3/4x4 1/2	27.34	Marvel	Delco	Delco	m-d	Own	Own	m Own	F Own	4.10
2885	2885	2885		3675c	3950	132	33x5	Cadillac.....61	Own.	8-3 1/2x5 1/2	31.25	Own	Delco	Delco	m-d	Own	Own	m Spicer	F Tim	Opt.
				3759	4300g															
1750	1790		2230d	2480	2575	122	32x4 1/2	Case.....X	Cont.	6-3 3/4x4 1/2	27.34	Rayfield	Delco	Delco	m-d	Own	Own	f Sneed	1 1/2 F Col.	4.66
			1900	1950c	2480	129	31x4 1/2	Case.....W	Cont.	6-3 3/4x5 1/4	31.54	Rayfield	Delco	Delco	m-d	Own	Own	f Arvac	1 1/2 F Col.	4.45
1185	1185		1445c	1595	1585	117	32x4	Chalmers.....1923	Own.	6-3 1/2x4 1/2	25.35	Strom.	A-L	Remy.	m-d	Own	Own	m Hardy	1 1/2 F Adams	5.13
			1345			122	32x4	Chalmers.....1923	Own.	6-3 1/2x4 1/2	25.35	Strom.	A-L	Remy.	m-d	Own	Own	m Hardy	1 1/2 F Adams	5.13
	1395	1545	1695c	1695	2295	123	32x4	Chandler.....Six	Own.	6-3 1/2x5	29.40	Strom.	Bosch	Bosch	s-p	B&B	Own	f Own	F Own	4.45
	1595			2195	2995g															
510	525	425g		680	860	103	30x3 1/2	Chevrolet.....Superior	Own.	4-3 1/2x4	21.76	Zenith Holley	Remy	Remy	c	Own	Own	m Own	1 1/2 F Own	3.77
				850																
710	725	625g		880	1060	103	30x3 1/2	Chevrolet.....M	Own.	4-3 1/2x3 1/2	19.60	Carter	Remy	Remy	m-d	Own	Own	m Mech	1 1/2 F Own	4.44
				1050																
1085	995		1095d	1295d	1395p	112 1/2	31x4	Cleveland.....42	Own.	6-3 1/2x4 1/2	22.50	Strom.	Bosch	Bosch	s-p	B&B	Own	m Mech	1 1/2 F Own	4.90
			1260d	1495d	1595p															
1885		1885	1885c	2585	2885	127 1/4	33x5	Cole.....890	North.	8-3 1/2x4 1/2	39.20	Johnson	Delco	Delco	m-d	North	North	m Spicer	F Col.	4.70
	1475		1925c	1995		115	32x4	Columbia.....Big Six	Cont.	6-3 3/4x4 1/2	27.34	Strom.	A-L	A-K	s-p	B&B	Durston	m Spicer	1 1/2 F Tim	4.75
985c	1135		1395d	1295	1465	115	31x4	Columbia.....Light Six	Cont.	6-3 1/2x4 1/2	23.44	Strom.	A-L	A-L	s-p	B&B	Durston	m Spicer	1 1/2 F Tim	5.10
	1095			1685																
1195	1235		1495b	1875f	2055	116	32x4	Courier.....	Falls	6-3 1/2x4 1/2	23.44	Strom.	West.	A-K	s-p	B&B	Muncie	f Flexite	1 1/2 F Col.	5.00
			1565c	2055																
		3000			4500	138	33x4 1/2	Crawford.....23-6-60	Cont.	6-3 3/4x5 1/4	31.54	Zenith	West.	Bosch	m-d	B-L	B-L	m Spicer	1 1/2 F Tim	.....
			3500c		4250	138	33x5	Crawford-Dagmar.....6-70	Cont.	6-3 3/4x5 1/4	31.54	Zenith	West.	Bosch	m-d	B-L	B-L	m Spicer	1 1/2 F Tim	.....
4350	4350c	4350	4350c	5300	5350	142	33x5	Cunningham.....V4	Own.	8-3 1/2x5	45.00	Strom.	Delco	Delco	m-d	Own	Own	f Sneed	F Tim	4.23
				6250f	6900g	132	33x5	Daniels.....23-38	Own.	8-3 1/2x5 1/4	39.20	Strom.	Delco	Delco	m-d	Own	Own	m Spicer	F Tim	4.23
				6900g																
1495	1295		1495c	1535	1795	115	31x4	Davis.....71	Cont.	6-3 1/2x4 1/2	23.44	Strom.	Delco	Delco	s-p	B&B	Warner	m Peters	1 1/2 F Tim	5.10
1595	1595		1695d	2095		120	32x4 1/2	Davis.....63-65	Cont.	6-3 3/4x4 1/2	27.34	Strom.	Delco	Delco	s-p	B&B	Warner	m Peters	1 1/2 F Tim	5.15
850	880			980	1410	114	32x4	Dodge Brothers.....	Own.	4-3 3/4x4 1/2	24.03	Stewart	N.E.	N.E.	m-d	Own	Own	m Own	1 1/2 F Tim	4.16
				1195																
	3950	3950	4150c	4985c	6800	132	33x5	Dorris.....6-80	Own.	6-4 x5	38.40	Strom.	West.	Bosch	m-d	Own	Warner	m Spicer	1 1/2 F Tim	4.23
870	885		980a	1240	1350	108	31x4	Dort.....23-18	Lyc.	4-3 1/2x5	19.60	Carter	Bosch	Conn.	m-d	Detlaff	Own	m Mech	1 1/2 F Flint	4.66
			995c	1020	1070															
1010	1025			1145	1195	115	31x4	Dort.....25-20	Falls	6-3 1/2x4 1/2	23.44	Carter	Bosch	Bosch	m-d	Detlaff	Own	m Mech	1 1/2 F Flint	4.66
				1355	1465															
5750	5500	5900	5750c		7500	134	33x5	Duesenberg.....Straight 8	Own.	8-27x5	26.45	Strom.	Delco	Delco	s-p	Own	Own	f Climax	1 1/2 F Own	4.45
890	890		1065d	1365		109	31x4	Durant.....A-22	Cont.	4-3 3/4x4 1/2	24.03	Till	A-L	A-L	s-p	Own	Warner	m Spicer	1 1/2 F Adams	4.33
				1465																
1600	1650		2250	2400		123 1/2	32x4 1/2	Durant.....B-22	Anst.	6-3 1/2x4 1/2	25.35	Rayfield	A-L	A-L	s-p	Ansted	Warner	m Spicer	1 1/2 F Tim	5.15
1485	1095		1395c	1595		112	32x4	Earl.....40	Own.	4-3 3/4x5 1/4	18.91	Scot	A-L	Conn.	s-p	B&B	Own	f Own	1 1/2 F Own	4.87
	965		1095	1425		112	31x4	Elcar.....4-60	Lyc.	4-3 1/2x5	21.03	Strom.	Delco	Delco	s-p	B&B	Warner	m Peters	1 1/2 F Salis	4.50
1395	1395		1595d	1975f	1995	118	32x4	Elcar.....6-60	Cont.	6-3 3/4x4 1/2	27.34	Strom.	Delco	Delco	m-d	Warner	Warner	m Spicer	1 1/2 F Salis	4.50
	1045			1145	1145	108 1/2	32x4	Essex.....	Own.	4-3 1/2x5	18.23	Own	Bosch	Bosch	m-d	Own	Own	m Spicer	1 1/2 F Own	4.66
	1195		1195	1895c	1985	120	32x4 1/2	Flint.....	Cont.	6-3 3/4x5	27.34	Strom.	A-L	A-L	s-p	Own	Warner	m Spicer	1 1/2 F Adams	4.75
269f	298s	235g		530	595	100	30x3 1/2	Ford.....T	Own.	4-3 1/2x4	22.50	Own	Own	Own	m-d	Own	Own	m Own	1 1/2 F Own	3.63
				725																
3900	3900		4900	4900		132	32x4 1/2	Fox.....7F	Own.	6-3 3/4x5	27.34	Zen th	West.	Scintilla	m-d	B-L	B-L	m Spicer	1 1/2 F Tim	4.90
	1950		2750c	2250	\$3150d	115	32x4	Franklin.....10	Own.	6-3 1/2x4	25.35	Own	A-K	A-K	s-p	B&B	Own	m Spicer	1 1/2 F Own	4.73
			2850f	2850																
995	995		1145c	1145	1445	112	32x4	Gardner.....Series 5	Lyc.	4-3 1/2x5	21.76	Zenith	West.	West.	s-p	B&B	Mech.	m Peters	1 1/2 F Flint</	



Type 61 Has Grown Even Greater

At its introduction, Type 61 was regarded as the greatest Cadillac ever produced and, indeed, as the criterion of fine car manufacture the world over.

Month by month, new features and refinements have been added as Cadillac engineers and craftsmen have worked to bring Type 61 even nearer to perfection.

Today, moulded and matured by intensive concentration on the one type, the car rises to a still higher plane of excellence, and its margin

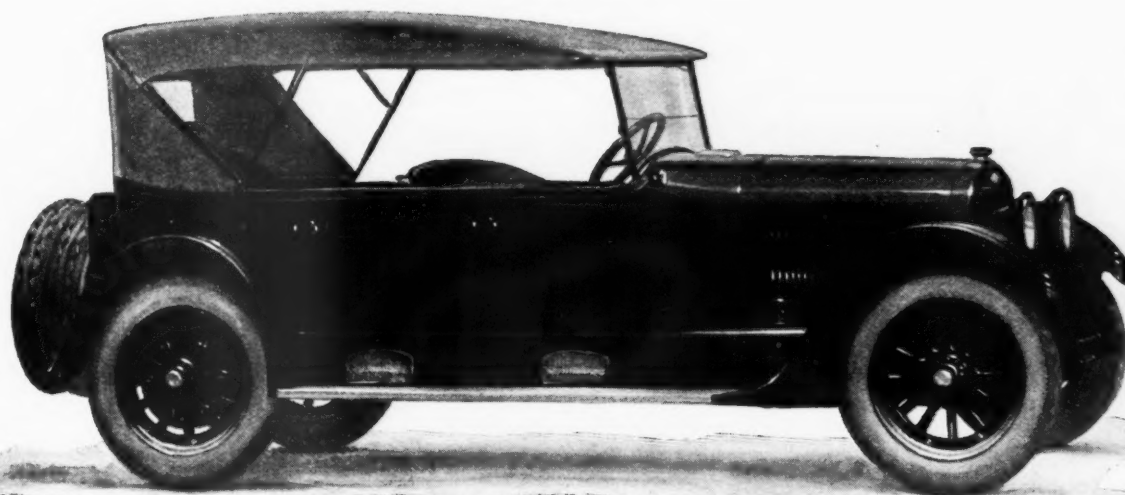
of leadership is noticeably increased.

Type 61 today is even finer, even more dependable and desirable, more representative in every way of Cadillac craftsmanship at its highest pitch.

Definitely proving this advanced quality and splendidly rewarding it, is the fact that in the past few months demand for Type 61 with its V-Type eight cylinder engine has reached its greatest magnitude and far exceeds the demand for any previous Cadillac.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICHIGAN

Division of General Motors Corporation



Type 61 Phaeton \$2885


S T A N D A R D • O F • T H E • W O R L D
C A D I L L A C



Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES							Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE				ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE	
OPEN MODELS			CLOSED MODELS			Make				No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make	Type and Make				Type and Make	Gear Ratio
2-3 Pass.	4-5 Pass.	6-7 Pass.	2-3 Pass.	4-5 Pass.	6-7 Pass.															
\$2395	\$1885	\$2385	\$2385c	3375	3075	124	32x4 1/2	Kissel.....45	Own.	6-3 1/2 x 5 1/2	26.38	Strom.	Remy.	Remy.	m-d Warner.	Warner.	m Spicer.	F Own.	3.92	
3985	4090	4090	.....	2975	5500	132	33x5	LaFayette.....	Own.	8-3 1/2 x 5 1/2	33.80	Johnson.	Delco.	Delco.	m-d Own.	Own.	m Own.	F Own.	4.58
1795	1795	1795	2145d	2345	2345	123	32x4 1/2	Lexington.....23	Anst.	6-3 1/2 x 4 1/2	25.35	Rayfield.	G-D.	Conn.	m-d Own.	Warner.	f Sneed.	F Salis.	5.10	
1575	1395	1575	.....	2085	2245	117	32x4	Liberty.....10-D	Own.	6-3 1/2 x 5	23.44	Strom.	Wagner	Wagner	s-p B&B.	Detroit.	m Spicer.	1/2 F Tim.	4.80
3800	3800c	3800	.....	1695	.....	130	33x5	Lincoln.....	Own.	8-3 3/8 x 5	36.45	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	F Tim.	4.88
8920	9500c	9600	.....	4400	4900	142	35x5	Locomobile.....Series 8	Own.	6-4 1/2 x 5 1/2	48.60	Ball&B.	West.	Delco.	m-d Own.	Own.	m Own.	F Own.	3.85
3385	3185	3185	.....	11750	12200	136	32x4 1/2	Marmon.....34	Own.	6-3 3/4 x 5 1/2	33.75	Strom.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	3/4 F Own.	4.10
885	885	.....	.....	3985	4685	109	31x4	Maxwell.....	Own.	4-3 3/8 x 4 1/2	21.03	Stewart.	Remy.	Remy.	c Own.	Own.	f Own.	1/2 F Own.	4.60
5400	4550g	5700	.....	1025d	1335	140	33x5	McFarlan.....1923	Own.	6-4 1/2 x 6	48.60	Rayfield.	West.	West.	m-d M&E.	B-L.	m Peters.	F Tim.	3.75
3950b	.....	3950c	.....	6720	6810	132	32x4 1/2	Mercur.....Series 5	Own.	4-3 3/4 x 6 3/8	22.50	Ball&B.	West.	Eisem.	m-d Own.	Own.	m Spicer.	F Own.	3.87
1695	3750c	3750c	.....	4850	5000	132	32x4 1/2	Mercur.....6	Own.	6-3 3/4 x 5	33.75	Strom.	West.	Eisem.	m-d Own.	Own.	m Spicer.	3/4 F Own.	3.77
1590	1995	1590	.....	119	119	119	32x4	Merit.....	Cont.	6-3 3/4 x 4 1/2	27.84	Strom.	Delco.	Delco.	s-p B&B.	Muncie.	f Sneed.	F Col.	4.63
.....	1600	1850c	2050c	2275	120	120	32x4	Mitchell.....F-50	Own.	6-3 1/2 x 5	29.40	Strom.	Remy.	Remy.	s-p B&B.	Own.	m Own.	F Own.	4.42	
.....	1295	1495d	1585c	1695	127	127	32x4 1/2	Mitchell.....F-50	Own.	6-3 1/2 x 5	29.40	Strom.	Remy.	Remy.	s-p B&B.	Own.	m Own.	F Own.	4.42	
.....	.....	.....	.....	1895p	115	115	31x4	Moon.....6-40	Cont.	6-3 1/2 x 4 1/2	23.41	Strom.	Delco.	Delco.	s-p B&B.	Warner.	m Spicer.	1/2 F Tim.	5.10
.....	1785	1995c	.....	2585	2485	128	32x4 1/2	Moon.....6-58	Cont.	6-3 3/8 x 4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	B-L.	m Spicer.	1/2 F Tim.	5.00
1240	1240	1645c	.....	2090	2190	121	33x4	Nash.....691-3-6-7	Own.	6-3 1/2 x 5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.80
915	935	1390	.....	1890	2190	127	34x4 1/2	Nash.....692-4-5	Own.	6-3 1/2 x 5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.80
2475	2475c	2375	2485d	1445	112	112	33x4	Nash.....41-8	Own.	4-3 3/8 x 5	18.23	Marvel.	Delco.	Delco.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.88	
2500	2500c	2600c	.....	1275	130	130	32x4 1/2	National.....BB	Own.	6-3 1/2 x 5 1/4	29.40	Rayfield.	West.	Delco.	s-p B&B.	B-L.	m Universal	F Col.	4.08
975	995	795g	.....	3500	118	118	33x5	Noma.....4C	Cont.	6-3 3/8 x 4 1/2	27.34	Zenith.	Delco.	Delco.	s-p B&B.	Detroit.	m Spicer.	1/2 F Tim.	4.45
975	975	1075c	.....	1515	115	115	32x4	Oakland.....6-44	Own.	6-2 1/2 x 4 1/2	18.99	Marvel.	Remy.	Remy.	e Own.	Muncie.	m Mech.	1/2 F Own.	4.68
.....	1850c	1735	.....	1445	115	115	32x4	Oldsmobile.....43 A	Own.	4-3 1/2 x 5 1/4	21.86	Zenith.	Delco.	Delco.	s-p B&B.	Muncie	m Own.	3/4 F Own.	4.70
1625p	1375	1675c	1875	2025	122	122	33x4 1/2	Oldsmobile.....46	Own.	8-2 1/2 x 4 1/2	26.45	Ball&B.	Delco.	Delco.	c Own.	Muncie	m Spicer.	F Own.	4.63	
525	525	425g	795	860	110	110	30x3 1/2	Oldsmobile.....47	Own.	8-2 1/2 x 4 1/2	26.45	Johnson.	Delco.	Delco.	s-p B&B.	Muncie	m Own.	3/4 F Own.	5.10	
2485	2485	2250g	2650c	3175c	126	126	33x4 1/2	Overland.....91	Own.	4-3 3/8 x 5	18.23	Till.	A-L.	A-L.	s-p B&B.	Own.	m Own.	1/2 F Own.	4.50	
.....	2350g	2685	.....	3325	133	133	33x1 1/2	Packard.....126	Own.	6-3 3/8 x 5	27.34	Own.	A-K.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.68
3850	3850	3850	.....	3525	136	136	35x5	Packard.....133	Own.	6-3 3/8 x 5	27.34	Own.	A-K.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.68
2695	2450	2450	.....	3575	131	131	33x4 1/2	Packard.....335	Own.	12-3x 5	43.20	Own.	Bijur.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.36
1550	1390	1425	1465d	5240	120	120	32x4 1/2	Paige.....6-70	Cont.	6-3 3/8 x 5	33.75	Rayfield.	Remy.	A-K.	m-d Long.	Warner.	m Mech.	1/2 F Tim.	4.45	
3300	2990	2990	.....	5240	128	128	32x4 1/2	Paterson.....23-6-52	Cont.	6-3 3/8 x 4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	Durston.	m Hartford.	1/2 F Salis.	4.80
5250	5250	5250	.....	5275	120	120	33x5	Peerless.....23	Own.	8-3 1/2 x 5	33.80	Ball&B.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Tim.	4.90
.....	1695	1745	1745	2445	138	138	33x5	Pierce-Arrow.....	Own.	6-4 x 5 1/2	38.40	Own.	Delco.	Delco.	m-d Own.	Own.	m Spicer.	1/2 F Own.	4.29	
3150	3100	3250	3300c	7000f	126	126	32x4 1/2	Pilot.....6-50	H-S.	6-3 1/2 x 5	25.35	Till.	Bijur.	Conn.	s-p Hoosier.	Muncie.	m Hartford.	3/4 F Col.	4.33	
1095	1095	.....	.....	3575	126 1/2	126 1/2	32x4 1/2	Premier.....6-D	Own.	6-3 3/8 x 5 1/2	27.34	Johnson.	Delco.	Delco.	s-p B&B.	Own.	m Spicer.	1/2 F Own.	4.88
2485	2485	2585d	3350	5100	117	117	32x4	Premocor.....6-40-A	Falls.	6-3 1/2 x 4 1/2	23.41	Strom.	Wagner	Wagner	s-p B&B.	Mech.	m Spicer.	1/2 F Own.	5.09	
.....	1665	2850	2850c	3500	128	128	32x4 1/2	Princeton.....	Anst.	6-3 3/8 x 5 1/4	27.34	Rayfield.	A-L.	A-L.	m-d Own.	Own.	m Spicer.	1/2 F Own.	5.12	
.....	1615	2900	2850c	3700	124	124	32x4 1/2	Princeton.....	Anst.	6-3 3/8 x 5 1/4	27.34	Rayfield.	A-L.	A-L.	m-d Own.	Own.	m Spicer.	1/2 F Own.	5.12	
.....	1485	2485	2685	2750c	117	117	32x4	R & V Knight.....R	Own.	4-3 3/8 x 5	22.50	Strom.	Wag.	Wag.	s-p B&B.	B-L.	m Spicer.	F Salis.	4.75	
.....	1615	2900	2850c	3500	124	124	32x4 1/2	R & V Knight.....H	Own.	6-3 1/2 x 4 1/2	29.40	Strom.	A-L.	A-L.	s-p B-L.	B-L.	m Spicer.	1/2 F Tim.	5.40	
.....	1485	2485	2685	2750c	117	117	32x4	Reo.....T6	Own.	6-3 1/2 x 5	24.34	Rayfield.	N.E.	N.E.	m-d Own.	Own.	m Own.	1/2 F Own.	4.70	
.....	1485	2485	2685	2750c	117	117	32x4	Rickenbacker.....B	Own.	6-3 1/2 x 4 1/2	23.44	Strom.	Bosch.	Bosch.	s-p Own.	Warner.	m Mechanics.	3/4 F Col.	4.63	
.....	1485	2485	2685	2750c	117	117	32x4 1/2	Roamer.....6-54-E	Cont.	6-3 1/2 x 5 1/4	29.40	Strom.	West.	Split.	s-p B&B.	G-L.	f Sneed.	1/2 F Tim.	4.60	
.....	1485	2485	2685	2750c	117	117	32x4 1/2	Roamer.....6-54-E	Cont.	6-3 1/2 x 5 1/4	29.40	Strom.	West.	Split.	s-p B&B.	G-L.	f Sneed.	1/2 F Tim.	4.60	
.....	1485	2485	2685	2750c	117	117	32x4 1/2	Roamer.....4-75-E	Roach.	4-4 1/2 x 6	28.90	Strom.	West.	Split.	s-p B-L.	B-L.	f Sneed.	1/2 F Tim.	4.08	
.....	1485	2485	2685	2750c	117	117	32x4	Rolls-Royce.....40-50	Own.	6-4 1/2 x 4 1/2	48.60	Own.	Bijur.	Bosch.	c Own.	Own.	m Own.	F Own.	3.25	
.....	1485	2485	2685	2750c	118	118	32x4	Rubay.....	Own.	4-2 1/2 x 5 1/4	12.10	Strom.	Bosch.	Bosch.	s-p Own.	Own.	m Universal.	F Own.	5.10	
.....	1485	2485	2685	2750c	108	108	33x4	Sayers Six.....DP	Cont.	6-3 3/8 x 4 1/2	27.34	Strom.	Delco.	Delco.	s-p B&B.	G-J.	m Arvac.	1/2 F Eaton.	4.75	
.....	875	875	.....	303 3/4	112	112	30x3 1/2	Seneca.....L-2 & O-2	Lyc.	4-3 1/2 x 5	19.60	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Universal.	1/2 F Peru.	4.75
985	985	.....	.....	3115e	112	112	31x4	Seneca.....50 & 51	Lyc.	4-3 1/2 x 5	19.60	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Universal.	1/2 F Peru.	4.80
.....	2500	2500c	.....	3300	127	127	34x4 1/2	Standard.....99	Own.	8-3 1/2 x 5	33.80	Zenith.	West.	Split.	s-p B&B.	G-L.	m Arvac.	1/2 F Tim.	4.45
.....	3600	3500	3600	130	130	34x4 1/2	Stanley.....740	Own.	2-4 x 5	None.	None.	Bijur.	None.	None.	None.	None.	None.	1/2 F Own.	1.50
2750	2750	2750	2425g	580c	102	102	30x3 1/2	Star.....	Cont.	4-3 1/2 x 4 1/2	15.63	Till.	A-L.	A-L.	s-p Own.	Warner.	m Spicer.	1/2 F Tim.	4.87	
319r	348a	285g	.....	645	125	125	34x4 1/2	Stearns-Knight.....SKL4	Own.	4-3 3/8 x 5 1/2	22.50	Rayfield.	West.	A-K.	m-d Own.	Own.	f Climax.	1/2 F Own.	4.50
2250	2250	2275c	.....	3150	130	130	34x4 1/2	Stearns-Knight.....6	Own.	6-3 3/8 x 5	27.34	Rayfield.	West.	A-K.	m-d Own.	Own.	f Climax.	1/2 F Own.	4.70
2250	2700	2850	2700c	3350c	130	130	34x4 1/2	Stephens.....10	Own.	6-3 1/2 x 4 1/2	25.35	Strom.	Delco.	Delco.	s-p B					



What "Pirate Parts" Can Never Hope to Do.

THE only policies that are good for your business are those that are best for your customers.

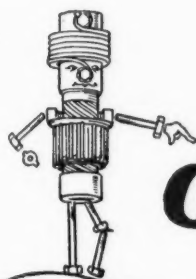
Honest service, based on skilled workmanship and quality materials—this is the one and only foundation for business friendships, confidence and profit.

And it is clear that inferior replacement parts can never equal better and genuine parts in the vital business of building confidence, good will and profit.

"Pirate" parts are an imposition on the man who buys them unknowingly. And, in this case, they are equally injurious to the man who sells them.

In our experience none but a genuine part will give our standard of satisfactory, dependable service in The Bendix Drive.

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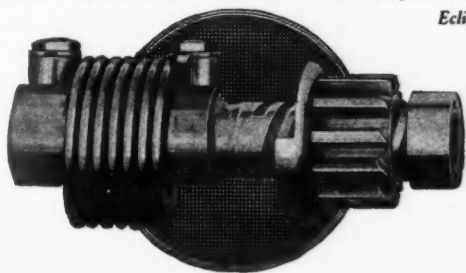


It pays to sell none but
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FOR
BENDIX
DRIVE

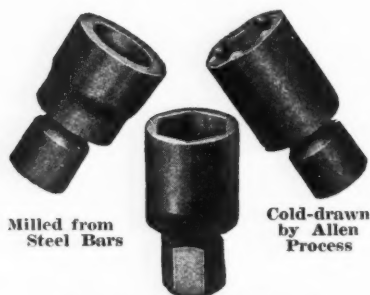
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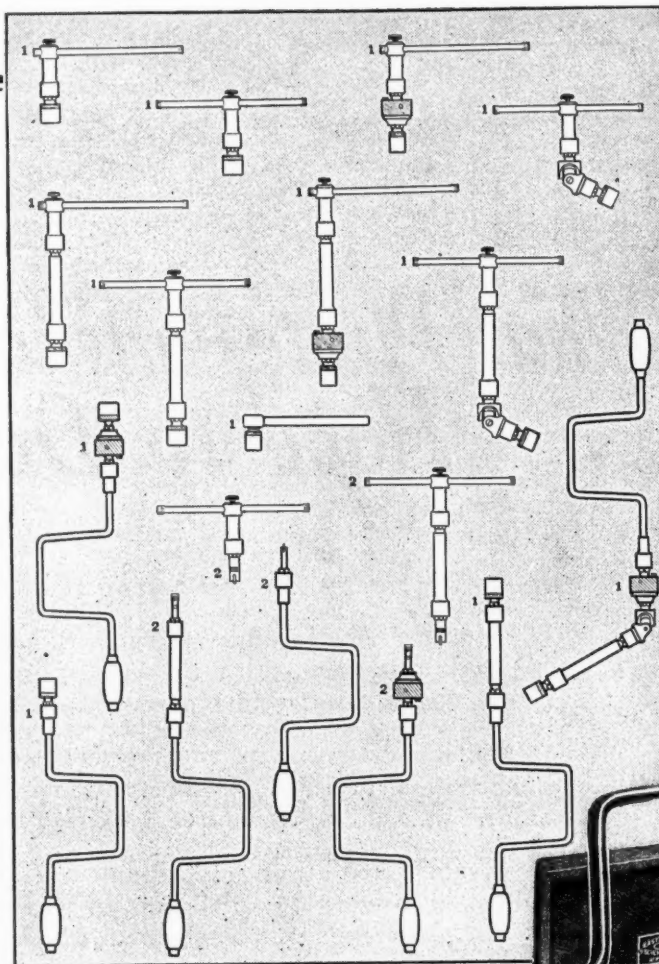
- 10 Short Lever Wrenches
- 10 Long Lever Wrenches
- 10 Short Tee Handle Wrenches
- 10 Long Tee Handle Wrenches
- 10 Short Wrenches with Ratchet
- 10 Long Wrenches with Ratchet
- 10 Long Speed Wrenches
- 10 Short Wrenches with Universal
- 10 Long Wrenches with Universal
- 10 Speed Wrenches with Ratchet
- 10 Speed Wrenches
- 10 Long Speed Wrenches with Ratchet
- 10 Offset Wrenches
- 2 Short Handle Screwdrivers
- 2 Long Handle Screwdrivers
- 2 Speed Handle Screwdrivers
- 2 Long Speed Handle Screwdrivers
- 2 Screwdrivers with Ratchet



Milled from Steel Bars

Cold-drawn by Allen Process

Heat-treated and Hardened
Sockets will not break



140 combinations —all in this ONE set

HERE you have everything you need in the way of a wrench, assembled in one small box

- compact, accessible,
- equal to every requirement and always a perfect joy to use.

* * *

IN point of completeness, strength, quality, workmanship, serviceability, there is nothing that approaches this set. In the Universal Set you get

- sockets that will not break, turned down from solid bar steel, cold-drawn by Allen Process to form the hex and heat-treated and hardened to give additional strength.
- a Ratchet consists of only three parts, a unit by itself that can be combined with all the attachments, a ratchet that always ratchets.
- a Universal that is milled from solid steel, smooth-acting and non-fouling.
- an Adjustable Tee Handle that takes the place of a large assortment of Tee and Lever

Handles and is a real mechanical achievement.

- a new and patented spring device which holds parts in combination with just sufficient friction.
- and the Speed Wrench takes all sockets and attachments contained in the Universal Set.

GUARANTEED

H & G Wrench Sets are guaranteed against faulty material or workmanship. The sockets are particularly guaranteed not to break or wear round. Of course, we know any part can be broken with misuse, but leave it to you to decide if it should be replaced.

* * *

YOU need this set of wrenches to work to advantage and reach the hard-to-get-at nuts. By having your wrenches always before you, you save time, money, patience, barked fingers and do the job in a business-like manner.

Ask your dealer to show you this wrench. Write for complete description.

THE EASTERN MACHINE SCREW CORPORATION, 10-20 Barclay St., New Haven, Conn.
Manufacturers of H & G Self-Opening Die Heads which revolutionized threading in the automotive industry

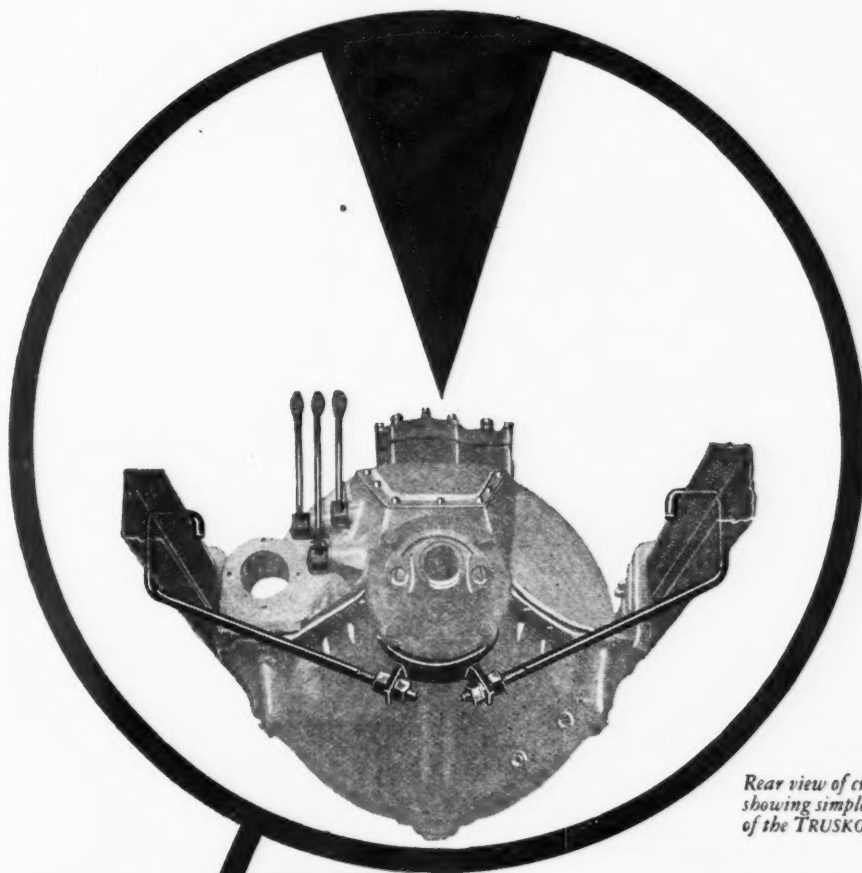
SOCKET



WRENCH

A fact

Operators of truck and delivery fleets are the shrewdest buyers of equipment in the world. Within a few months after the TRUSKO Brace had made its appearance on the market, 90 of San Francisco's largest firms had adopted it for their Ford fleets.



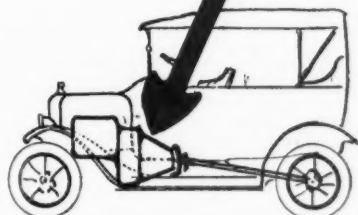
Rear view of crank case showing simple installation of the TRUSKO Brace

The TRUSKO Brace for Fords

There has probably never been a Ford accessory which has met with such immediate success as the TRUSKO Brace. The reason is that TRUSKO really ends destructive vibration—does it thoroughly and positively by providing a rigid support for the crank case and drive shaft.

Sidesway is mechanically impossible. The power plant and transmission are held firm and steady. The sudden wrench and jar of road shocks are taken up by the entire frame instead of being delivered against vital parts of the mechanism. There is a smoother running engine, longer life for the car, and a saving in repairs.

The TRUSKO Brace is quickly and easily installed. A list price of \$2 means no sales resistance. Jobbers and dealers should write for complete information.

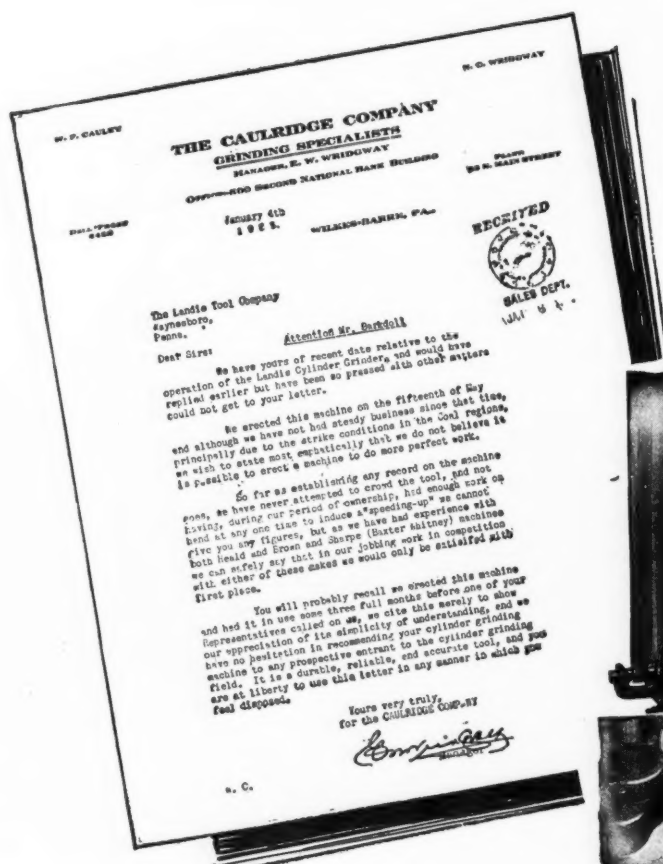


-ends destructive vibration

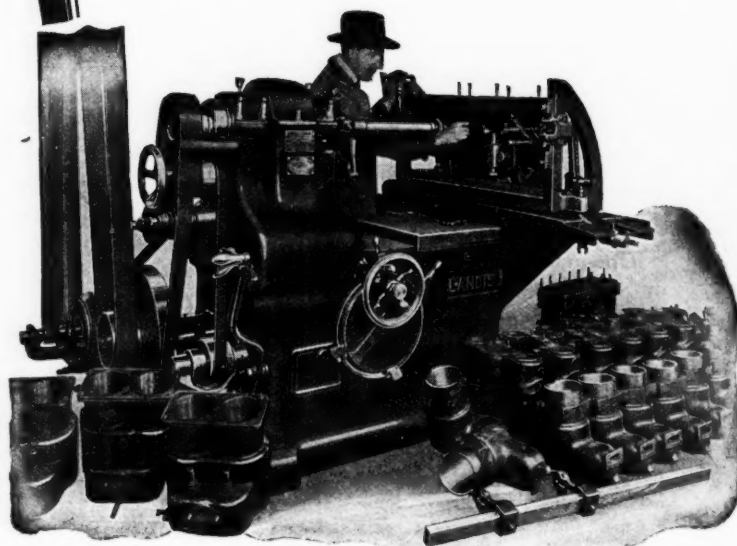
The TRUSKO Inc.

NAPA, CALIFORNIA
FORMERLY OF 15 DUBOCE AVENUE
SAN FRANCISCO





**"Not possible to erect
a machine to do
more perfect work"**



Consider these points

Maximum diameter machine will grind.....	10"
Maximum diameter hole machine will grind—regular equipment	5 3/8"
Minimum diameter hole machine will grind—regular equipment	2 1/2"
Maximum depth machine will grind with regular spindle	15"
Off center movement of wheel spindle	1 1/8"
Feed of wheel spindle, per revolution of outer eccentric sleeve .....	.0005 to .0015
Rotary speed of outer eccentric sleeve R. P. M.	40 and 82
Speed of grinding wheel spindle R. P. M.	5415 and 7075
Maximum traverse of work carriage	31 1/2"

**Will you feel like
this toward the grinder
you select?**

Read this letter—

With experience in grinding cylinders on two other makes of machines, the Caulridge Co., Grinding Specialists, Wilkes-Barre, Penna., write that they "do not believe it possible to erect a machine TO DO MORE PERFECT WORK." They go on to say they "have no hesitation in recommending it—a durable, reliable, accurate tool."

The Landis Cylinder Grinding Machine makes an ideal Service-Station tool. It produces perfect work in the hands of garage mechanics.

Among its many time-saving features is the Work-Centering Bar for quickly aligning the cylinder casting and the grinding wheel spindle—no matter how the size of different blocs may vary. A Ford, a Packard, a tractor engine bloc, all the same day—all quickly set up by this time-saving device.

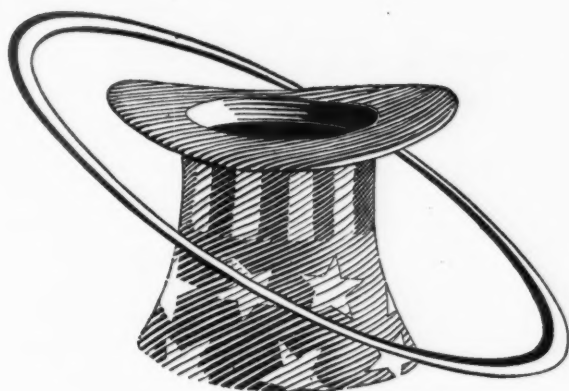
Made by an organization of grinding-machine specialists. You are invited to write us.

LANDIS

LANDIS TOOL CO., WAYNESBORO, PENN.

New York Office: 51 Chambers Street

**Are You
Overlooking**



**This
Opportunity?**

Rickenbacker

A • CAR • WORTHY • OF • ITS • NAME

Leon T. Shettler, Rickenbacker Distributor

in Los Angeles, opened his doors April first, 1922.

In just one year—up to March 31st, 1923, we had shipped him 773 cars.

Southern California is the most keenly contested territory in the United States.

Every car you ever heard of—and some you don't know exist—are represented there.

"But—Shettler is an Exception"—You Say

All right:—

Diesing Motor Sales Company, St. Louis, secured the Rickenbacker franchise and, as their new show room was not ready, really began business in the booth at the St. Louis Show—February 12 to 17th.

Ordered a carload—one of each model to start with.

Before the end of the week had wired for two more carloads.

To date we have shipped St. Louis 52 Rickenbackers.

Going good and accelerating every minute.

"Jim" Ward, Manager of Diesing Motor Sales Company, says:

"I have sold a lot of automobiles in my time—and my last line was one of the most popular, the best advertised makes of cars.

"But I have never known a car that sold itself as this Rickenbacker Six does.

"Just ask the prospect to take the wheel for ten minutes—the car does its own talking, and I'll say it's some eloquent speaker."



Rickenbacker

A • CAR • WORTHY • OF • ITS • NAME

"But My Town Hasn't a Population of 775,000"—you reply

Very well:—Let's look at Rochester, N. Y.—200,000:

O. E. Brown signed up February 9th, 1923. Shipped him 23 Rickenbacker cars in first 60 days.

Interested in Figures from Smaller Towns?

Here are some:—

Alton Downs, Live Wire, Elkhart, Indiana:—had 18 Rickenbackers from February 21st to April 12th (day this ad was written) 18 cars in 50 days in a town of 20,000: Practically a suburb of South Bend, too.

Then take Oklahoma City—60,000 or so:

Wills Sainte Claire Company of Oklahoma, secured this franchise February 14th—sold seven cars week of Auto Show, and we had shipped April 12th (less than two months) 37 Rickenbackers.

Roanoke, Virginia, (34,000) 9 cars in first 30 days; Tampa, Florida (35,000) 12 cars in the same period; Peoria, Illinois, (65,000) 49 cars in the eight months that H. Gatton has been handling this line.

AND LITTLE LOGAN, West Virginia (1,500) has sold 12 Rickenbackers in ten months.

Can You Make Money With This Line? We Ask You: Can You Help It?

And—talk about competition!

Lansing, Michigan, (57,000—14,000 of whom work in automobile factories) home of three big plants all making mighty good automobiles:—Clifford Rhodus sold 64 Rickenbackers in his first year.

More a prospect knows about how cars are built the more he appreciates Rickenbacker quality.



(Continued on next page)

Rickenbacker

A • CAR • WORTHY • OF • ITS • NAME

Some Excellent Territory—A Few Big Cities— Still Open

Yet Rickenbacker distributors and associates in other cities, towns, and villages, of similar size, are going like a-house-a-fire—selling cars, making money and making friends.

New York, Chicago, Detroit have all passed the 700 mark, Boston doing a wonderful business; so in Philadelphia, Pittsburg, Cincinnati, Indianapolis, San Francisco, Seattle, Portland—and 300 other towns.

At this writing, Cleveland, Kansas City, Atlanta, Ga., Dallas, Fort Worth, New Orleans, Memphis, Omaha and other excellent territories are "open."

This Is Not An Apology—It's A Boast

For we maintain that No Representation is better than Mis-Representation.

The concern or the individual which secures this five-year non-cancellable contract must measure up to certain definite standards.

Not so much capital as character.

So when we do grant the Rickenbacker franchise, success is a certainty from the very start.

From the multitude of applicants we have selected our present excellent sales force consisting of 59 distributors and about 300 associates.

And the records show about 95 per cent of them are making money.

If you are a live one, looking for a live line, let us hear from you. Tell us all about yourself—in strict confidence of course.

Success Mated with Success Breeds Success.

Touring Phaeton—\$1485

Coupe—\$1885

Sedan—\$1985

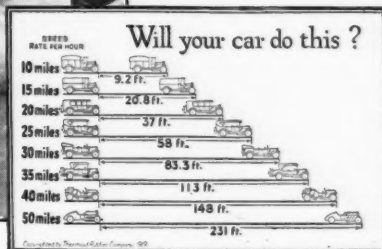
*All prices are f. o. b. factory, Detroit, Michigan, plus federal tax
—and are subject to increase without notice.*

Rickenbacker Motor Company
Detroit Michigan





Famous Thermoid Standard Chart—shows distances in which car should stop if brakes are efficient. Brakes lined with Thermoid meet these standards.



“It comes already compressed— saves you money on adjustments”

*Read how thousands of Thermoid dealers are
increasing their brake lining business*

“Here’s one brake lining we’ve never had a kick on,” said the garage man. “It’s Thermoid, and it’s dense and firm because it’s got 40% more material compressed into it than any other lining made. We save money for our customers on it because it needs less adjusting than ordinary linings.”

This is true. What’s more, this tremendous hydraulic compression gives your customers absolute safety from the first day on. Thermoid is so dense and compact that it brakes without having to wear down and “squeeze out” for a certain period on the brake drum.

**Why Thermoid is last to
“squeeze out”**

We take the “squeeze” out of Thermoid in the factory—in its place we put 40% more material

That’s why Thermoid is last to “show the fuzz” between drum and brake band. That is also the reason for the longer life of a Thermoid Lining.

Remember this: when you reline with Thermoid, you’re giving your man not only absolute protection and longer wear, but a definite money saving through fewer needed adjustments.

This year, millions of motorists will learn these facts about Thermoid through our national advertising. To get your share of this business, write for prices and full information about the sales help furnished to all Thermoid dealers.

THERMOID RUBBER COMPANY

Factory and Main Offices, Trenton, N. J.

New York	Chicago	Los Angeles	Detroit
Cleveland	Kansas City	Seattle	Atlanta
Boston	London	Paris	Turin

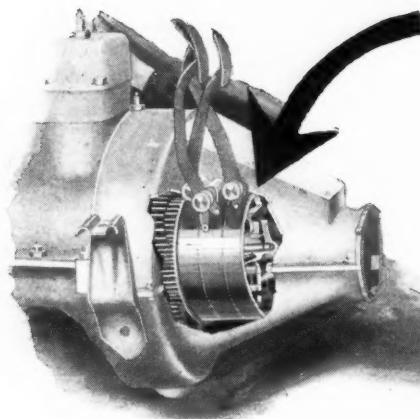


The new Thermoid Brake Relining Machine. Cut time 60%—does a better job than old hand methods. Price \$15. Write for special offer to Thermoid dealers.

Thermoid Brake Lining

Hydraulic Compressed

*Makers of “Thermoid-Hardy Universal Joints”
and “Thermoid Crolide Compound Tires”*



A motor problem of ten years' standing—solved!

**A Ford transmission lining that *will not*
*foul the oiling system***

Since the beginning, the transmission lining has meant a choice of two evils for every Ford owner.

Untreated lining—made of cotton—with poor gripping power and poorer wearing quality—

Or treated linings that grip better—but dissolve their compounds in the oil and destroy its lubricating value.

After long experiment, the Thermoid engineers perfected a lining that is *absolutely insoluble in oil*. It is called Rexoid.

On the right is shown a startling test made for this lining in the laboratories of Princeton University.

The beakers held five different makes of transmission lining, and the same grade of oil as lubricates both cylinders and transmission in Ford cars. After only six hours, four of the five linings had partially dissolved their treating compounds.

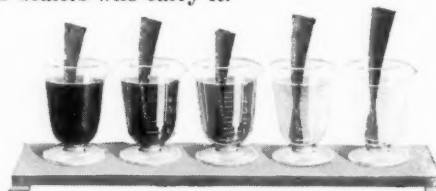
The oil in the fifth beaker was clear as when new. It held the strip of Rexoid.

ONLY in Rexoid do you find this insoluble compound. Hydraulic pressure compresses it into every fibre of a high-grade woven fabric. Compound and fabric become one solid mass.

This hydraulic treatment gives Rexoid

1. More material to the square inch
2. A smoother, more uniform surface and a longer life.

Now, at last, Rexoid provides the necessary high co-efficient of friction without fouling up the oil. It's easy to sell, just tell Ford owners about it. Rexoid is bringing home the business to dealers who carry it.



After 48 hours in oil, four makes of lining, A, B, C and D, had discolored the oil, giving off tar and other harmful ingredients. The only lining that did not foul up the oil was E—Rexoid.

Leading jobbers carry Rexoid. If your jobber cannot supply you, write us direct, giving his name.

THERMOID RUBBER COMPANY

Factory and Main Offices, Trenton, N. J.

New York	Chicago	Los Angeles	Detroit
Cleveland	Kansas City	Seattle	Atlanta
Boston	London	Paris	Turin



REXOID

Transmission lining for Ford Cars

McQUAY-NORRIS

PISTON RINGS

PISTONS

PINS

A COMPLETE LINE. A motor's *three vital units*. Essential to any dealer who wants *complete profits*. No one type of piston rings, for instance, will suit all needs. Sell the McQuay-Norris line—complete for every price and purpose.

LEAK-PROOF! The most efficient compression ring ever developed.

Supercyl! The original oil ring.

JIFFY-GRIP! The quick-seating ring with a non-butting joint that established new standards of value in the 50c field.

Snap Rings! Improved in materials and accuracy by McQuay-Norris methods.

And all these rings made of the famous Electric Iron, melted and refined in the McQuay-Norris Electric Furnace.

PISTONS AND PINS! Rounding out the complete line—all McQuay-Norris made. Enabling McQuay-Norris jobbers, service stocks and dealers to give a complete service under one long-established, nationally famous brand.

Profits! The leading line insures the largest turn-over. A McQuay-Norris Service Stock makes you local headquarters for Piston Rings, Pistons and Pins. It attracts orders from other repairmen, garages and dealers, as well as from car owners. Ask your jobber's salesman to explain this opportunity for greater profits or write us direct at once—Dept. M.

McQuay-Norris Manufacturing Co.

General Offices, St. Louis, U. S. A.
Connersville, Ind. Toronto, Canada



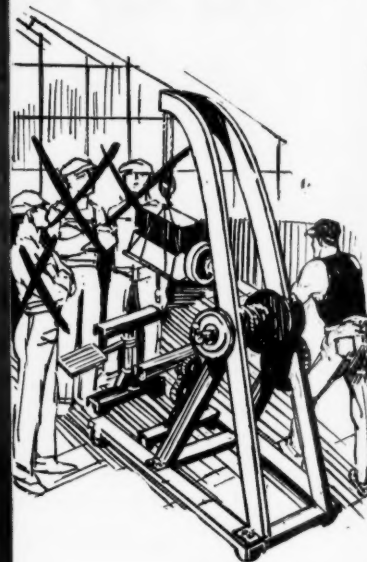
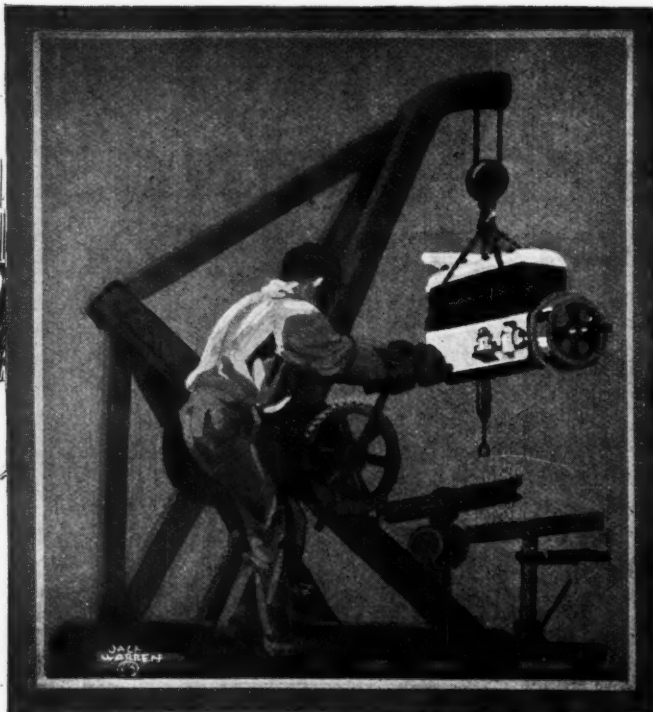
The Complete Line

LEAK-PROOF	....\$1.25
Supercyl	.....\$1.00
JIFFY-GRIP	.... 50c
Snap Rings	.... 25c
McQuay-Norris Wainwright Pistons and Pins	

Which way do you handle engine repairs in your shop?



Which way shows the most profit — one man or four?



Fighting Labor Waste in the Shop

SFA

What Should Good Shop Equipment Cost?

The only man who needs to worry about the cost of good shop equipment is the man who hasn't got any. For it is he, and not the well equipped shop, who is paying for it—paying for it in wasted labor, inefficient service, dissatisfied customers and lost business.

Good equipment pays for itself so quickly in increased business, augmented profits, and the good will of the community you serve, that it can truthfully be said to cost nothing, for its initial price is soon returned, and thereafter it is constantly at work producing revenue for the shop.

The sure way to build a profitable business that will grow each year!

WHAT have you got for sale?

TIME!

What happens, then, when four men do the work of one?

You lose the profits from three men's time. Or you charge the customer for four men's labor, when he should pay for only one.

In either case the loss to you is serious. For there is nothing like an excessive repair bill to drive good business away.

Think what it means, instead of having four men on one job, to have four men on **FOUR** jobs. Instead of one job at a loss, four jobs and **FOUR PROFITS**.

That is what it means to have proper equipment. It puts an end to inefficiency, to labor waste, to poor work, to dissatisfaction. It makes possible *correct shop practice*, which is the only route to good service, business stability and permanent prosperity.

Names Every Shop Man Should Know

ANY of the manufacturers listed below will help you in the selection of equipment best suited to conditions in your shop without obligating you in any way.

The Manley Mfg. Co. York, Pa.

Cranes—Wrecking and Floor
Presses—Garage and Arbor
Auto Hoists, Garage Lights
Garage and Service Jacks
Towing Trucks
Engine and Axle Stands
Portable Benches
Portable Tool Trays
Air and Water Stations
Truck Wheel Handler
Chassis Underworker

**"Good Equipment Plus
Knowledge Gives the Big-
gest Pay."—Ambu.**

Instruction in Automotive
Electricity

**Educational Division
The American
Bureau of Engineering
Chicago, Ill.**

Manufacturers of
Battery Shop Equipment

**Weidenhoff Products
4352-58 W. Roosevelt
Road. Chicago, Ill.**

Electrical Testing Devices
Test Benches
Battery Dischargers
Growlers
Magnetizers
Variable Speed Motors
Generator Holding Vises and
Driving Chucks
Mica Undercutters

**Continental Auto Parts
Co.
Columbus, Ind.**

Motor Overhauling, Radiator
and Axle Stands
Piston Vises, Gear Pullers
Creepers
Wrecking Trucks
Straightening Presses
Piston Aligning Devices
Burning-in Machines

**T. R. Almond Mfg. Co.
Ashburnham, Mass.**

Drill Chucks
Lathe Chucks
Micrometers, Outside
Micrometers, Inside, for Cyl-
inder Measurements

Wright Mfg. Co. Lisbon, Ohio

Wright High-Speed Chain
Hoists
Standard Screw Chain Hoists
Differential Chain Hoists
Steel Trolleys for Overhead
Track Systems
Hand Traveling Cranes

**The Burton-Rogers Co.
755 Boylston Street
Boston, Mass.**

Hoyt Electrical Instruments
Ammeters
Volt Meters
Rotary Meters
Growler Sets
Magnet Testers
Cadmium Meters
Cell Meters
Mohawk Rectifiers

**Weaver Mfg. Co.
Springfield, Ill.**

Auto Hoists, Axle Stands
Arbor Presses, Jacks
Ambulances
Tire Changers
Tire Spreaders
Wire Wheel Repair Stands
Bucket Pumps
Gasoline Cans

**Brunner Mfg. Co.
Utica, N. Y.**

Air Compressors
Air Tanks
Air Hose
Air Valves
Automatic Pressure Controllers

**Mid-West Mfg. Co.
Minneapolis, Minn.**

Red Devil Dolly Jacks
Tire Changing Jacks
Adjustable Garage Horses
Garage Cranes and Ambulances
Burnishing Machines and
Burnishing Compounds

**The Jacobs Mfg. Co.
Hartford, Conn.**
Drill Chucks

**Oxweld Acetylene Co.
Newark, Chicago,
San Francisco**

Oxy-Acetylene Apparatus and
Supplies
Ever-Ready Welding, Cutting
and Lead-Burning Outfits

**Stevens & Company
375 Broadway
New York**

**Stevens "SPEED-UP"
Tools**

Piston Aligner
Microgauge
Piston Vise
Valve Reseaters and Refacers
90 Special Tools for Ford
and Fordson
Sectional Cabinets

**Frank Mossberg Co.
Lamb St.
Attleboro, Mass.**

**Wrenchsmiths for 20
Years**

Solid Socket Wrenches
"Tee" Handles
Speeders, "Swivel Joint"
"Tee" Handles and Speeders
Special Wrenches and Tools
for Fords
Miscellaneous Automobile
Tools
Socket Wrench Sets and
Accessories
Engineers' Wrenches
Adjustable Wrenches
Metal Stampings

**The Black & Decker
Mfg. Co.
Baltimore, Md.**

Portable Electric Drills
Electric Air Compressors
Electric Portable and Bench
Grinders
Electric Valve Grinders
Bench Drill Stands

**Kellogg Mfg. Co.
Rochester, N. Y.**

Kellogg Electric Motor Driven
Garage Compressors
Kellogg Air Towers
Kellogg Valves
Kellogg Gauges

**Bonney Forge &
Tool Works
Allentown, Pa.
Attleboro, Mass.**

Original Chrome-Vanadium
Drop Forged Wrenches
Original Chrome-Vanadium
Valve Tappet Wrenches
Carbon Steel Drop Forged
Wrenches of all kinds
Stillson Pipe Wrenches
Adjustable Wrenches
Combination Wrenches
Garage and Small Vises
Battery and Grease Cup Pliers
Body Iron Assortments
Special Automobile Tools
Drop Forgings



**"The Best-Equipped Shop
Gets the Business"**

This advertisement is published and paid for by the concerns listed above who are pioneers in the development of time and labor-saving equipment for automotive service work.

These concerns are co-operating with all automotive service men, and you are cordially invited to write to any of them for information and advice regarding the class of equipment shown below their names.

**SERVICE EQUIPMENT
ASSOCIATES**

THERE is a special BETHLEHEM PLUG for every car made. Sell the *right set* for the *right* car and you'll be surprised at the results.

When you've converted a "missing" motor into six-sweet-running cylinders, believe me you've made a real friend and a grateful customer who'll never forget you.

Let me send you a set for your own car "on suspicion." If Bethlehem Plugs don't give more all-round satisfactory service in your own car, don't pay me one cent.

Chas. Schwalb
President.

BETHLEHEM SPARK PLUG CO., INC.
Bethlehem, Pa.



bethlehem betterments

A Leaf from the Book of Success

MEMO JONES BROS. GARAGE

4/25/23 Note:

Sold 39 Bethlehem Spark Plugs this week and not a single complaint. They cost us less and show more profit, too! It pays to sell a spark plug that's proved its worth.

Believe me, when Packard, Studebaker, Stutz, International Harvester and White have Bethlehem as standard equipment, they must be right!

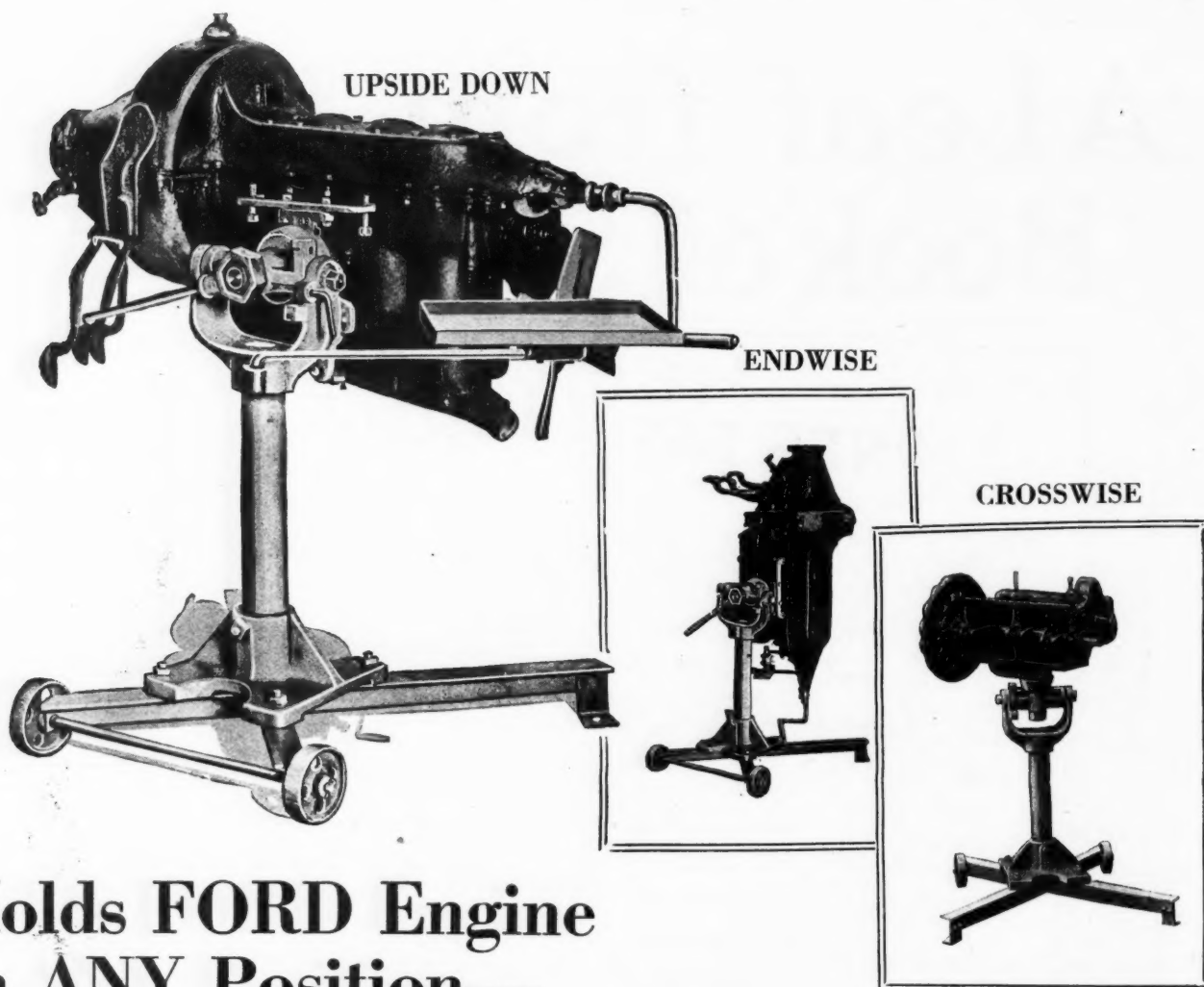
P.S.

Bill Smith just came in for four more Bethlehem No. 8's for his brother's Ford. Says his 1914 Ford has more power and pep since he put in Bethlehem — runs like new! See, whiz! I didn't know I could sell so many spark plugs till I took on Bethlehem!

BETHLEHEM SPARK PLUG CO. INC.
BETHLEHEM, PENNA.

for motor'dom

Utilities —
Not EXCESSories!



Holds FORD Engine in ANY Position—

cuts overhauling-time

Half of all cars are Fords. Half of the repair business must come from Fords. And about half of the average Ford motor repair is getting the job IN EXACTLY THE RIGHT POSITION.

The MANLEY Engine-Stand for Fords does this—and experience proves that it does cut overhauling-time.

—has a Universal Joint which swings the motor endwise and sidewise. Locks motor in any position—at any angle, by tightening the Manley Cone Clutch.

Special fixture bolts through two holes in engine-block flange and to water-connection pad, a boss fitting tightly into water opening in this way taking strain off the bolts. Rigid, SAFE.

No stud passes between cylinders—no interference in getting at center bearing nut. Handles both the new and old type motor.

Single upright of steel tubing—not cast iron, extra narrow base to permit workman getting close to his job, wheels at one end, for portability when needed. Last, but important, the metal tool-tray on the swinging bracket.

This Stand and other Manley Garage Equipment in our catalog which we are always glad to send. Better get it and look it over.

Ask any Jobber handling Manley Equipment and don't be satisfied unless you get it.

MANLEY MFG. CO.
YORK, PA.



Any Shop with
Manley
Garage Equipment
MADE IN YORK PA.

is the best equipped Shop—
it gets the business



With the aid of the Manley Axle Attachment, the Ford Engine-Stand is converted into AN AXLE STAND. This, in three minutes. Not a compromise axle stand, mind you, but one of the highest qualifications. This, too, is in the Manley catalog.



More Chance of Selling Your Prospect With the Complete Elcar Line

The motor car prospect of limited means will want the Elcar Four-Cylinder Phaeton at \$965; the man in the next class may want a four at \$1425 or a six at \$1395; another man will want one of the bigger, finer Elcars at \$1995; there's an Elcar for the price level of most prospects—**THAT'S WHY YOU CAN SELL THEM.**

The Elcar line—Fours and Sixes, and the widely-used taxicabs— will insure continuous profit. A good line—a financially-sound factory—an organization that's backing you up all the time: what more could a dealer want?

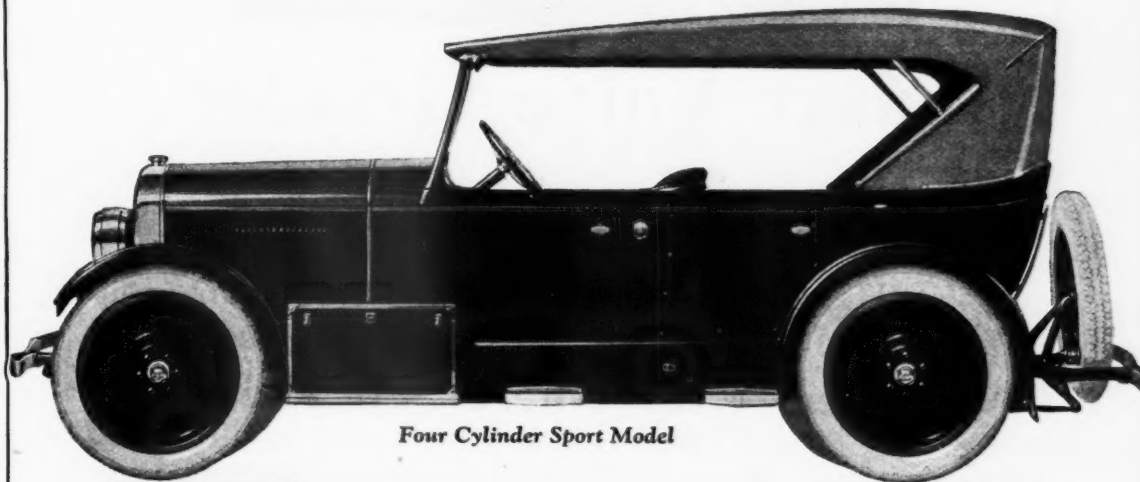
Write or wire and we'll tell you this big-profit story

ELCAR MOTOR COMPANY, Elkhart, Indiana
Builders of Fine Vehicles Since 1873

Fours \$965 to \$1425

Sixes \$1395 to \$1995

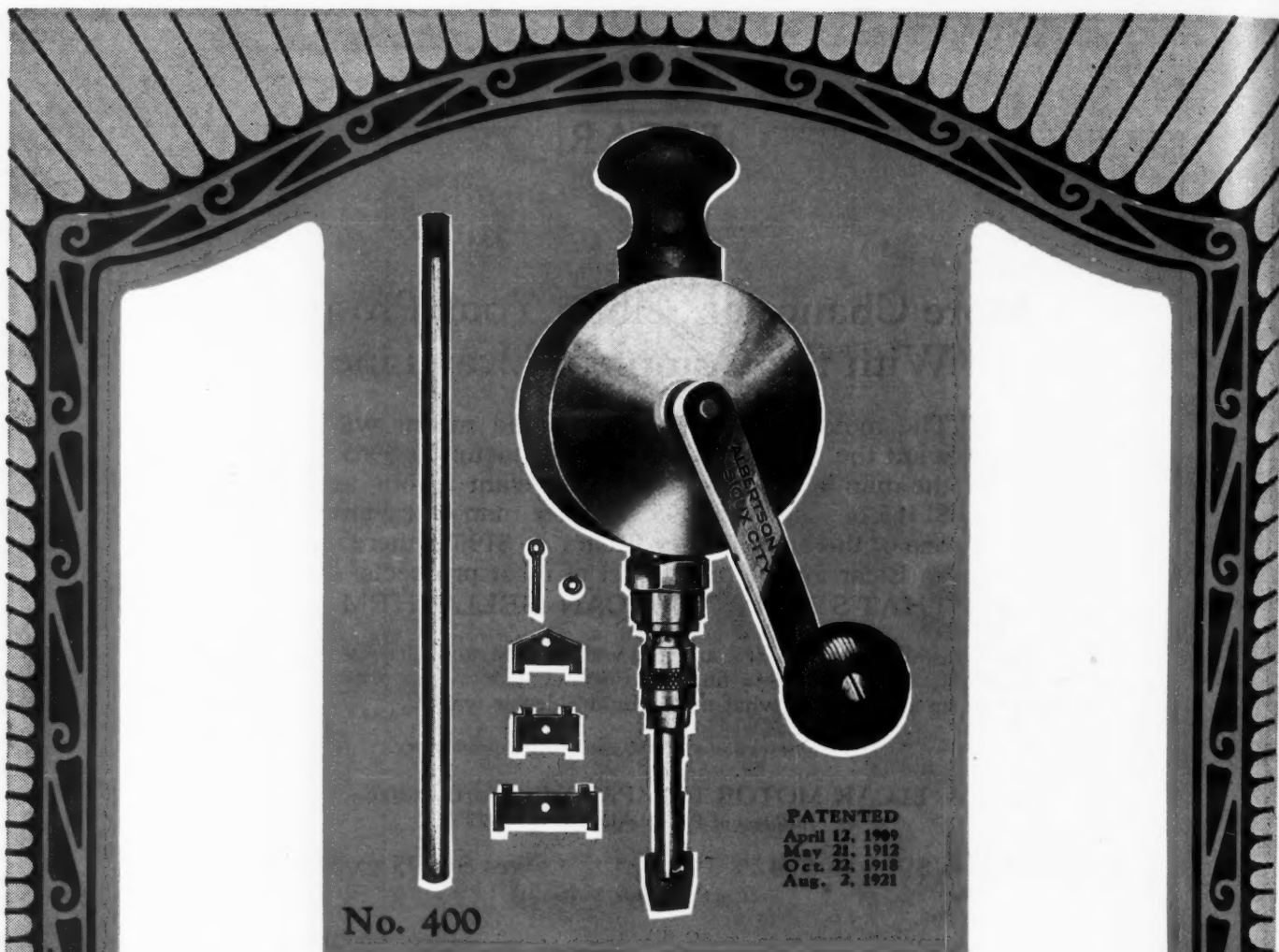
[f. o. b. Elkhart, Indiana]



Four Cylinder Sport Model

ELCAR

A WELL BUILT CAR

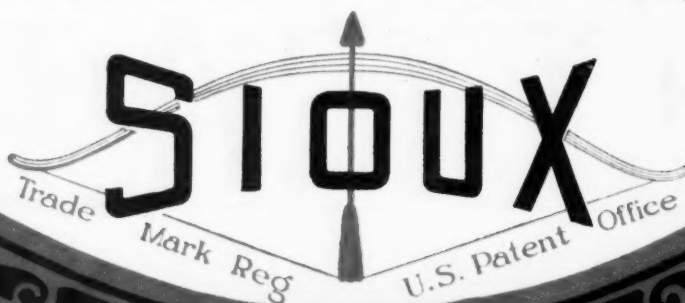


Sioux Valve Grinder

Time is money and time lost is avoidable waste. You can cut your avoidable waste by the use of this fast and efficient Sioux Valve Grinder. Grinds correctly and quickly. Has that reciprocating, or back and forth motion on the valve, so necessary to perfect valve grinding.

Jobbers Everywhere Sell Them

Write for Catalogue and Valve Seat Reamer Specifications
ALBERTSON & CO. SIOUX CITY, IOWA





New Organization and Finances behind the Monroe

THE Monroe car, one of the best values ever produced in its class, is now owned and being manufactured by the STRATTAN MOTORS CORPORATION.

Back of the manufacturing and selling of this popular priced car is a group of successful automobile executives—strongly financed.

—men who know automobile manufacturing and selling from every angle.

The Strattan Motors Corporation has two important projects in view for immediate action—

The continuance of the Monroe on a bigger and more firmly established and genuinely serviced basis.

And the production of the new STRATTAN car within ninety days. This car at \$695, together with the Monroe, will make for the proper parties a dealer connection of unusual merit and profit.

Our plan is simple.

Direct factory contracts backed by real sales service in every locality where we have dealers.

We invite your early and careful consideration of our business, our personnel and our plan.

MONROE

DIVISION

STRATTAN MOTORS CORPORATION
INDIANAPOLIS, U. S. A.



Differentials That Stand This Test Must Have a High Factor of Safety



IF you were to make a practical test of differential efficiency, you could not do better than choose this tank truck which operates out of Riverside, N. Y. in the Adirondack Mountains traveling over the ranges 125 miles daily. It surmounts severe grades with ease, has no trouble in making good time over its route. It is equipped with Brown - Lipe - Chapin Differential.

Such a continuous performance is possible only because of quality. Brown - Lipe - Chapin differentials are made under most careful inspection, checking and rechecking. This care in quantity production is largely responsible for the development of the Differential to its present high state of perfection.

Brown-Lipe-Chapin Co.
SYRACUSE, N. Y.

BROWN-LIPE-CHAPIN DIFFERENTIALS

Duesenberg Helps the Other Lines

A dealer in a certain eastern city recently said, "Almost immediately after taking on the Duesenberg car I noticed a change for the better in the attitude of my prospects toward my organization. I investigated and found that the prestige which is an inseparable part of the name Duesenberg had impressed these people with the fact that my organization must be conducted on a pretty high plane. Not only have I sold Duesenbergs, but also cars from my other lines as a result of taking on the Duesenberg car."

Think this over in connection with yourself. It is not the only reason why Duesenberg dealers are so enthusiastic about the line; but it is a mighty good one. A request from you will bring full details concerning the Duesenberg franchise in your territory.

DUESENBERG AUTOMOBILE & MOTORS CO., INC.

Indianapolis
Indiana



FOUR WHEEL HYDRAULIC BRAKES

In this view of one of the forward brakes (completely enclosed in operation) note the tubular front axle and the double steering arm, one of the very few examples of its kind. It provides the extreme strength of racing practice in a passenger car.

Here is safety of the most advanced type. It is a factor that motorists will demand. It can be merchandised.

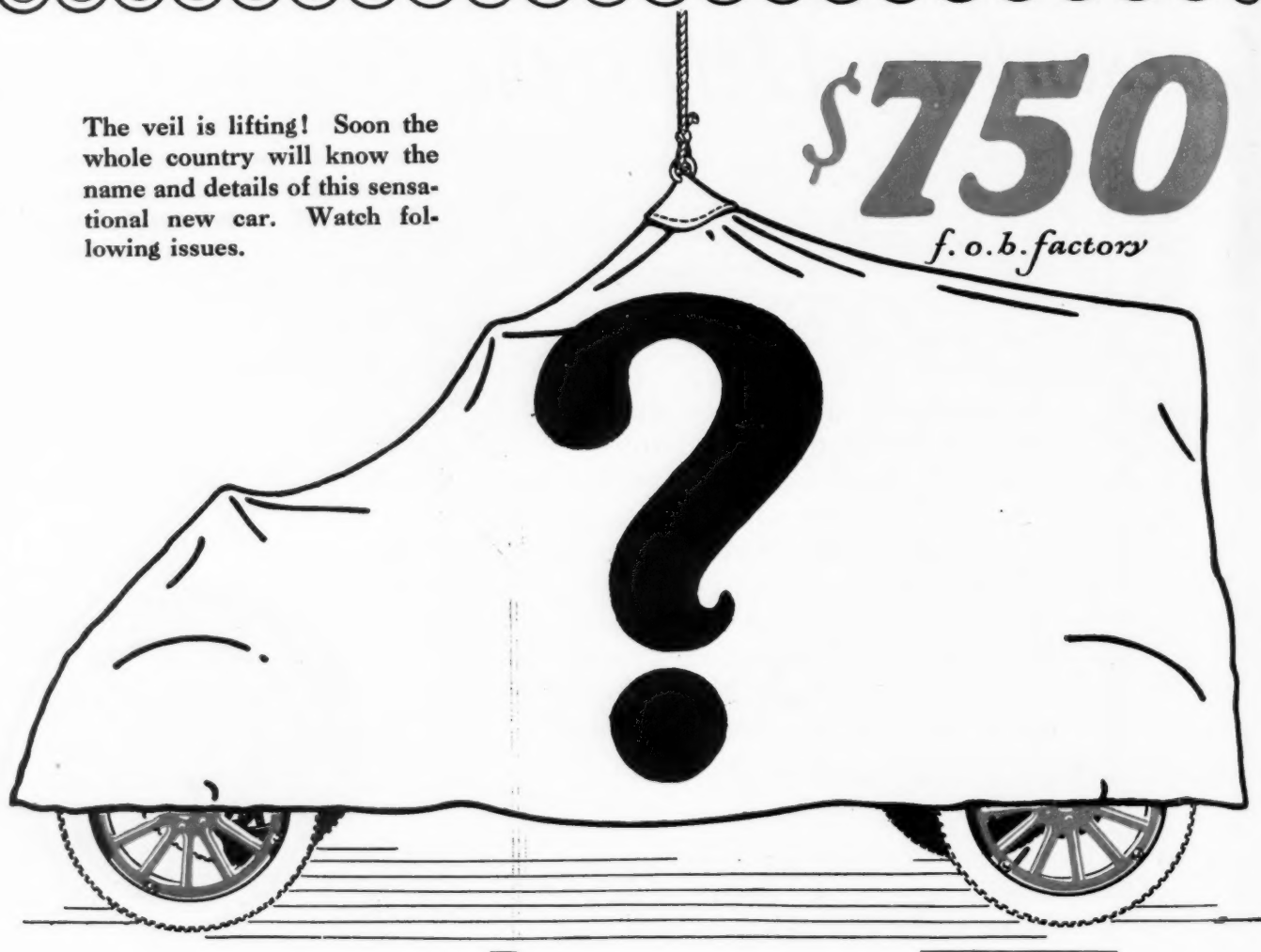
DUESENBERG

The Original Straight-Eight

with Four Wheel HYDRAULIC Brakes

The veil is lifting! Soon the whole country will know the name and details of this sensational new car. Watch following issues.

\$750
f. o. b. factory



THE moment this new car is uncovered and announced to the public, the wonder will be that it didn't come long ago. Backed by one of the largest and most influential manufacturers in the industry, it will instantly command a huge market heretofore untouched. It brings the greatest profit-making opportunity dealers have had in years.

No pioneering! No experimenting! The name of this new car is as well known by the American public as Spearmint Gum, Camel Cigarets or Ivory Soap!



What You Get for \$750

Large roomy body.
Long wheelbase.
Cord Tires.
Bumpers front and rear.
Nickeled radiator and lamp-rims.
Rich red Spanish grain upholstery.
Khaki top.
Liberal discount to dealers.
One of the largest advertising campaigns in the world.
A Golden Rule factory policy toward dealers.

Don't wait! Don't delay! If you are to be the lucky dealer in your town, write at once for particulars. Address

"Leading Manufacturer,"

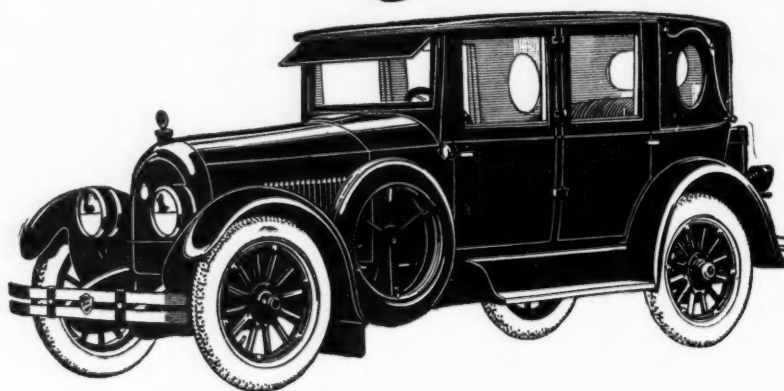
care Dept. 24

MOTOR AGE,

5 So. Wabash Ave., Chicago, Ill.

KISSEL

The Custom Built Car



Tomorrow's Motor Car Today

The motor car that fully satisfies the eye does so, not through accident, but because carefully calculated designing has overcome a host of problems that in the ordinary automobile are left unsolved.

Kissel designers, working hand in hand with Kissel engineers, are able to create a harmony of line throughout the entire car that could never be achieved save by men working under

the same roof and animated by the same ideals of true custom-building.

Nowhere is this principle better expressed than in the model "Fifty-five" Brougham-Sedan—a car that combines an advanced body style with the exceptional power, speed and flexibility of the improved Kissel Custom-Built Motor.

The Owner of a truly fine car expects these qualities and values them.

Dealers: We want you to see for yourselves why the Kissel is the right car, at the right price, to make real money for you. A visit to the Kissel factory, or a demonstration of the Custom-Built Six, will convince you that the Kissel is really designed and built from start to finish as you would build a car for your customers. The car itself is creating a sensation among motorists who appreciate quality. Yet its price is a revelation to those who have seen it perform. The combination means dealer profit. Write for a copy of our dealer manual and let us show you the car it describes.

also a Phaeton
at \$1485
with Kissel-Built Body

KISSEL MOTOR CAR CO.

Hartford, Wisconsin, U. S. A.

Prices f. o. b. factory

What Is Clean Steel? Why?

Experience in making more than 80,000,000 Timken Tapered Roller Bearings proves that a clean, thoroughly-deoxidized steel is best for anti-friction bearings*—and that such steel can be best produced by the electric furnace process.

Timken Steel is clean, thoroughly-deoxidized steel†—made in the electric steel mill owned and operated by The Timken Roller Bearing Company.

Timken Steel is *clean* steel, for no sulphur or other undesirable elements are introduced into an electric furnace; and no impurities are added, such as oxygen in the open hearth process, or impure iron in the crucible process.

Timken Steel is *thoroughly-deoxidized* steel, for electric furnaces permit oxidizing, deoxidizing, or neutral operations at will.

And Timken Steel, *because* it is clean steel, and *because* it is thoroughly-deoxidized steel, can be so successfully heat-treated (to give the finished bearings their glass-hard surfaces and tough, elastic, inner cores) that records of several hundred thousand miles of service are not at all uncommon for Timken Tapered Roller Bearings.

The Timken Roller Bearing Company is the only bearing company which makes its own steel and its own seamless tubes, and rods, in its own electric steel mill, rolling mill, tube and rod mill.

The Timken Roller Bearing Co
CANTON, OHIO

*Send for paper by Timken metallurgists read before Iron & Steel Institute of London, England, "Influence of Dissolved Oxides on Carburizing and Hardening Qualities of Steel".

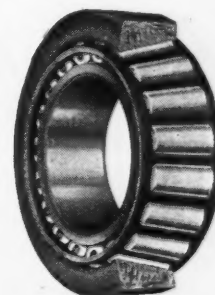
†Send for booklet, "Timken Steel".

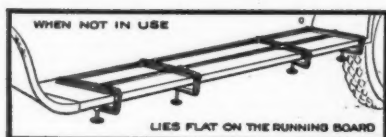
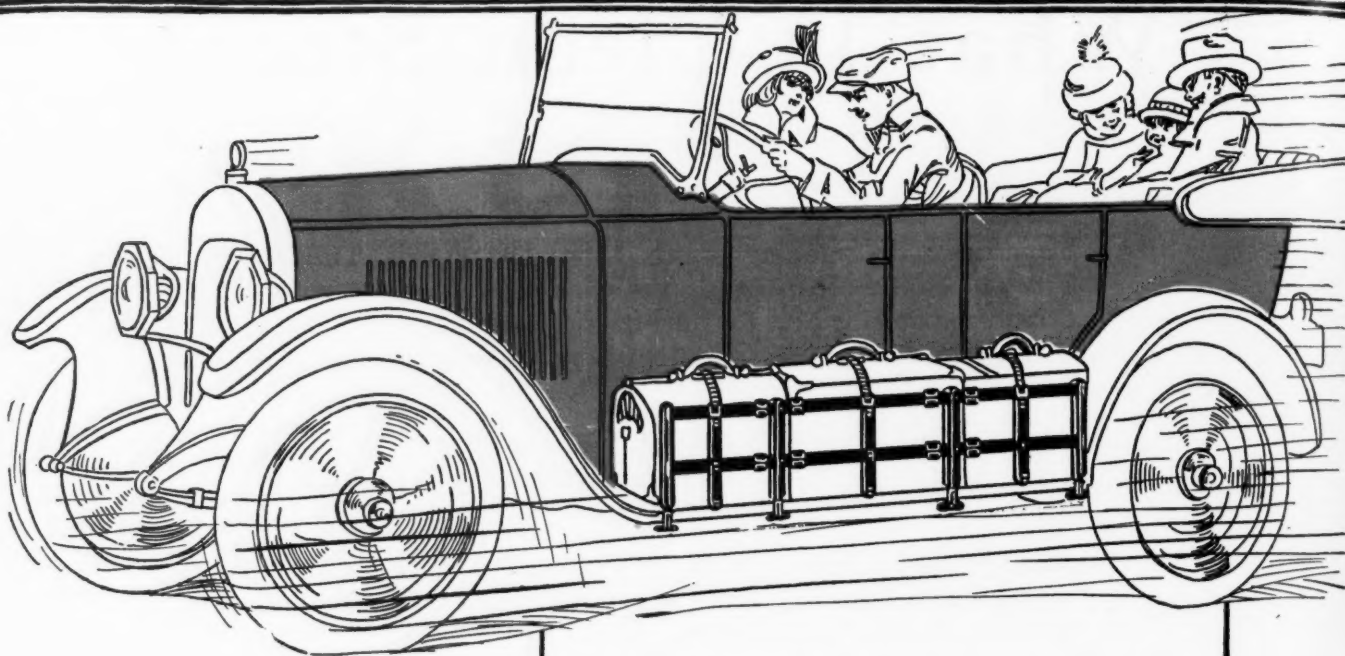
The
Analysis of
Timken Steel is:

Carbon	.15—	.20
Manganese	.45—	.60
Phosphorus		.04
Sulphur		.04
Silicon	.15—	.20
Chromium		
(Cups & Cones)	.40—	.50
Chromium (Rollers)	1.00—	1.20

TIMKEN
Tapered
ROLLER BEARINGS

© 1923, By The T R B Co, Canton O





*Sold by Live
Jobbers and
Dealers*

Dealers—Your jobber has an interesting proposition on the Marquette. It will pay you to get it.

SUIT cases and bags can't rub or scratch the body finish of the car when carried in a Marquette. The luggage is **strapped to the carrier** away from the car. An ingenious steel clamp holds the strong web straps to the carrier.

No motorist is satisfied with any other carrier, once he sees the "**Marquette.**"

Folds Down Flat. When not in use the Marquette Luggage Carrier folds right down flat on the running board. It is always ready when you want to use it—yet never in the way when not in use.

Enhances the appearance of any car. The long, neat lines of the "**Marquette**" conform with the lines of the finest automobiles.

Made in 2 sizes — both adjustable in length, 4 feet and 5 feet when extended. Fits any running board. Quickly attached without tools. Made of special high-grade steel. Finished in black enamel.

MARQUETTE MFG. COMPANY
St. Paul, Minn.

MARQUETTE

LUGGAGE CARRIER

EVERY MOTORIST IS DEMANDING SAFETY—

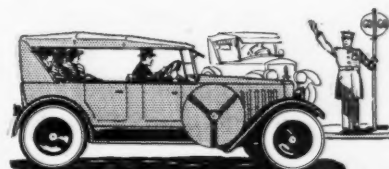


How does a catcher stop a swift pitched ball so easily?

He brings it to a stop gradually, with increasing resistance.

HERE IT IS

How do you bring your car to a stop safely? Not by suddenly throwing on the brakes—that causes skidding, rips the tread off the tire or breaks a rod. Gradual, increasing application of the brake power brings your car to a safe stand.



An Engineering Triumph

The Bumper That Has Captured Motordom

EVERY experienced motorist and car dealer who sees the Chain Guard recognizes it as real *Protection*—the scientifically constructed bumper that eases every impact to a stop gradually, with increasing resistance.

With 10,000,000 cars now running—with the other millions coming out this year—with ordinary bumper bars lasting only six months—figure your possible sales volume and profit on Chain Guards—the scientifically built bumper that has captured motordom.

Write for engineering analysis showing the enormous strength and resistance of Chain Guards—their scientific principle—their novel patented features. Learn our sales plan—get our dealer helps. Qualified dealers are urged to write today.

AMERICAN MOTOR GUARD COMPANY

2019 S. Michigan Avenue • CHICAGO

Why Do We Use Chains?

Because chains are absolutely flexible—they pull, but can not push.



Chains divert the impact at right angles and distribute it equally throughout the entire bumper structure, A-B-C-D. They resist gradually and increasingly. They neutralize vibration and never crystallize. Can not rattle because constantly under a 600-lb. spring tension.



Chain Guards offer a broad and perfectly flexible band of protection with 7-point suspension and short leverage balanced resistance.



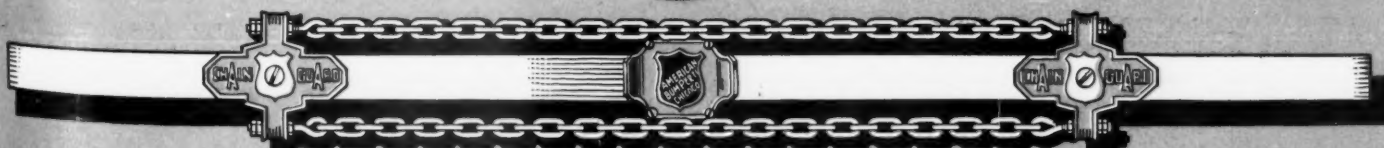
The weight of the Chain Guard bumper is carried on radius rods that rest on the main axle—taking the load off the front end of the frame—adds 10 to 15% to tire mileage, with greatly increased riding and driving comfort.

Chain Guards are the sensation of the season—the dealer opportunity of the year.

Styles and prices to fit all cars. Universal brackets.

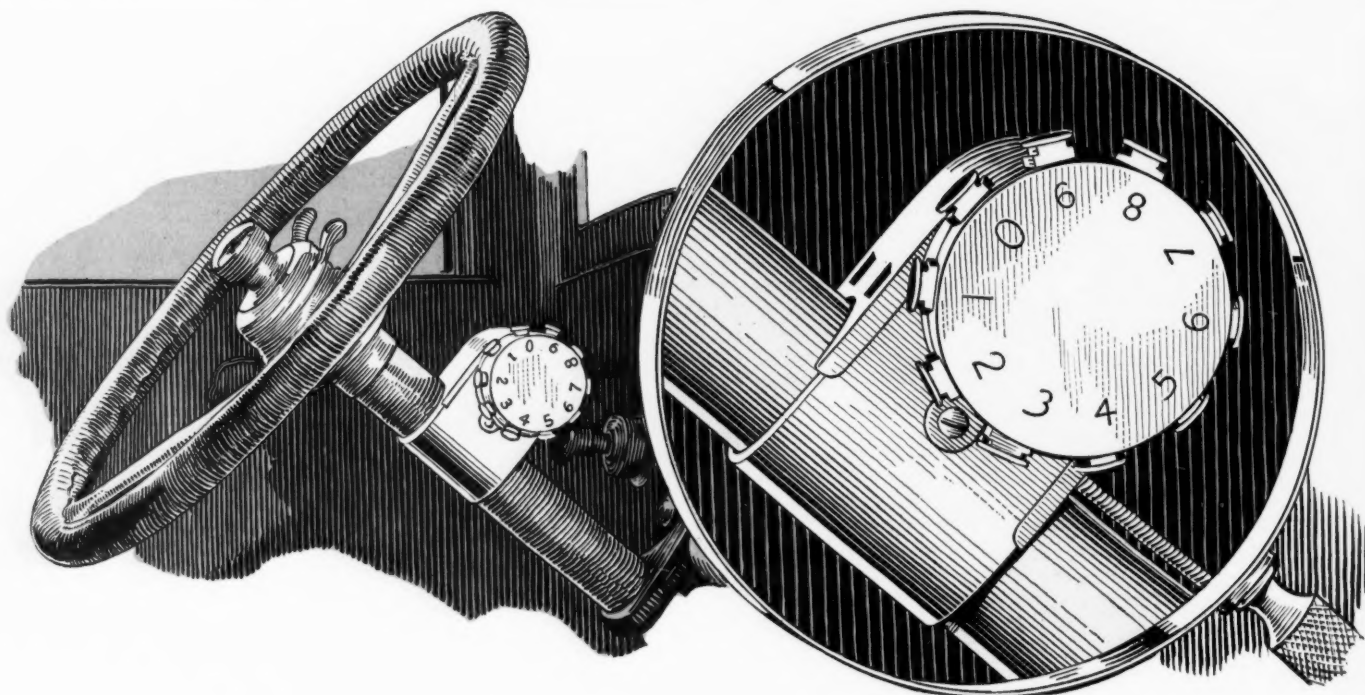
Qualified dealers—write for full information today.

Built Like  a Bridge



CHAIN GUARD BUMPERS

KEEPS THE CAR UNTIL THE OWNER COMES FOR IT!



Locks as It Stops—Unlocks at the Owner's Touch—

THE Universal Keyless Auto Lock is a 10-button formation. In 20 minutes you can attach it to the steering post and wire it to the ignition. Set it for any formation you choose, preferably a three or four-button number—your house, your telephone, or any easily remembered code.

Touch the button to shut off the ignition—that locks your steering column. The driver can not forget to lock his car—can not start his motor until he has unlocked the steering column—can not by any possibility lock the steering column while the motor is running.

Change the formation in half a minute while in unlocked position—new code every month if you wish.

To remove the lock while in locked position is impossible without wrecking the steering column to the point where the car could not be operated.

Made of case-hardened steel—impossible to take down while locked.

Saves the car owner time—worry—insurance money—saves the car because the owner can not forget to lock it and the thief can not pick the lock.

\$15.00 list. Dealers—write for sample, terms, and dealer co-operative sales plan.

Here's the lock that has met all comers—

For years it has guarded the cars entrusted to its care despite all the tricks of auto bandits, all the tools of the mechanic.

It solves all the difficulties that have come up in connection with other auto locks.

It has earned its right to leadership.

You know the enormous market that awaits the lock that's right. Here it is. Investigate it—satisfy yourself—pick it, smash it, take the car away from it if you can.

Then show it to the car owners you serve—it will ring up handsome profits. Qualified car dealers—write for full information today.

AMERICAN MOTOR GUARD COMPANY

2019 S. Michigan Avenue • CHICAGO

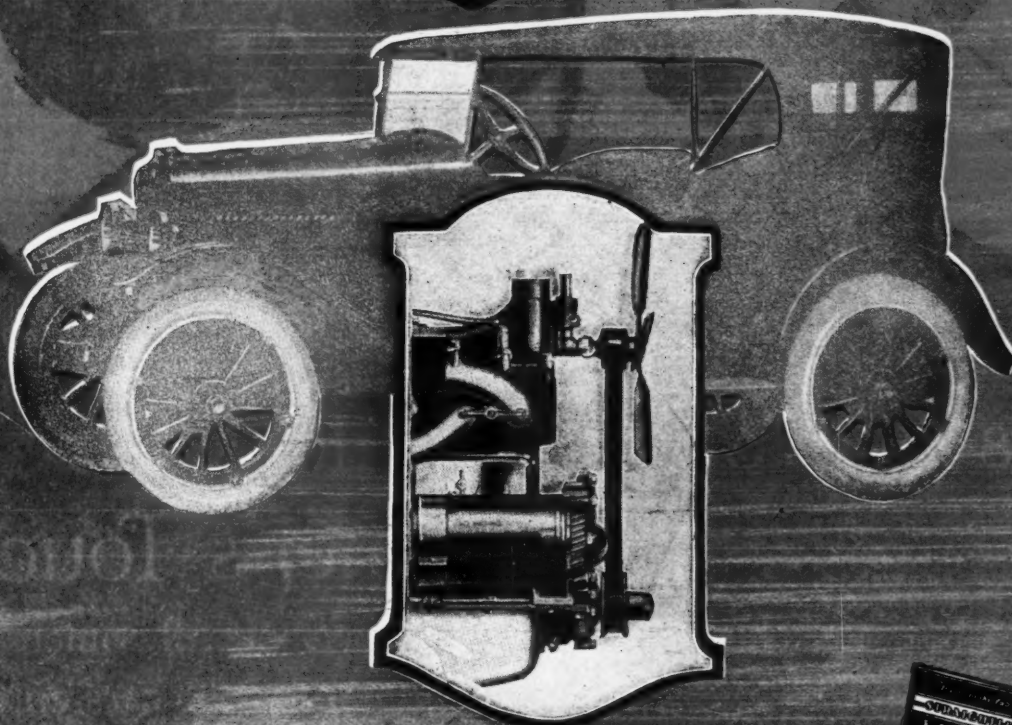
UNIVERSAL KEYLESS AUTO LOCK



STRAIGHTLINE

ENDLESS FAN BELTS

No. 102 for *Overland* Model 4



JUST as No. 102 is ideal for the Overland, there is a **STRAIGHTLINE** Endless Fan Belt scientifically designed to meet the actual service conditions on every automotive engine.

If your jobber can't supply you, send us your order, with his name and address.

Write for catalog No. 4



Made for Service—
Boxed for Sales

Permanite Transmission Lining for Fords never loses its firm, velvety grip.

MILLS
NEWARK, N.J.

GENERAL SALES OFFICE
WOOLWORTH BLDG. NEW YORK

The Rosendale-Reddaway

BELTING AND HOSE COMPANY

SOLE MANUFACTURERS OF "CAMEL-HAIR" BELTING

GATES HOSE

"The Standardized Radiator Hose"



Marked by Inches
Easily Cut to Length

An especially tough rubber lining—because radiator hose gets all its wear inside—that's why 90,000 dealers are recommending Gates Vulco Hose.

Made by the World's Largest
Manufacturers of Fan Belts.



The Assurance of Unvarying Quality

THE immense plants of Russell, Burdsall & Ward produce *millions* of bolts and nuts in a single week. Yet one imperfect head, a broken thread, an unfilled shoulder on *one* out of these millions will jeopardize, if ever so slightly, the reputation for quality that has been over three quarters of a century in building. The watchfulness that guards this reputation is your assurance of the unvarying quality which must be in every Empire Bolt.

RUSSELL, BURDSALL & WARD
BOLT & NUT COMPANY

PORT CHESTER, N.Y.

TEMPERWICK, CONN. • CHICAGO • SAN FRANCISCO • ROCK FALLS, ILL.

Makers of Bolts, Nuts and Rivets Since 1845

EMPIRE BOLTS

The Standard Spark Plug of the World



This Is How the AC Market Lines Up in Your Community

Think of all the Chevrolets—They have always been AC-equipped.

—*all the Buicks*—AC-equipped for fourteen years.

—*all the Dodge Brothers*—have never used anything but AC.

—*all the Nash cars*—always AC-equipped.

—*Oaklands*—for the past fourteen years AC-equipped.

—*all the Overlands*—AC-equipped for years.

—*and all the other cars:* Apperson, Cadillac, Case, Chalmers, Chandler, Cole, Dort, Essex, Haynes, Hudson, Hupmobile, Jewett, Jordan, LaFayette, Marmon, Maxwell, Oldsmobile, Paige, R&V Knight, Star, Willys-Knight, *and more than two hundred others.*

—all AC-equipped and already in use in your locality!

This tremendous ready-made market for AC's is right at your door and will always be there in ever-increasing size.

Chevrolet is making about 2,000 cars a day.....

Buick is turning out over 700 a day.....

Dodge Brothers are making over 700 cars a day.....

Durant and *Star* over 500 cars a day.....

Overland and *Willys-Knight* close to 400 a day.....

All AC-
Equipped

Then add all the others and just visualize the enormous production, every day, of cars factory-equipped with AC plugs. Each day, the demand for AC's grows bigger.

For fifteen years AC's have been making friends until today there are millions of motorists who will have no other plugs and other owners are fast realizing that AC's are the safe plugs to use.

Also, with the AC Carbon Proof now made in all sizes, you have the most successful plug ever devised for motors that have a tendency to foul spark plugs.

Read on another page about the AC 1075 *Special for Fords*, which gives you an opportunity to take first place in the enormous Ford plug replacement business.

These facts prove that so far as spark plugs are concerned AC is the logical line upon which you should concentrate.



*"Mr. Motorist this is what
you have always wanted"*

The AC Plug Kit—to
carry your spare plugs.

Make Four Sales Instead of One

The sales possibilities in AC plugs, set forth on the opposite page, speak for themselves. Here is an added way to sell more AC plugs *by the set*, either for replacement or as spares.

You could easily sell more sets of AC's if motorists had a convenient, handy, compact container in which to carry extra plugs without risk of damage. Investigation has shown us that this is something most motorists have always wanted but never could get.

AC now has such a container ready for you to offer—the *AC Plug Kit*—made of metal and designed to carry four plugs safely.

When a motorist asks for a plug place the *AC Plug Kit* before him, containing four plugs, and point out to him that probably what he needs is a new plug in each cylinder to be assured of a better running motor. Show him how convenient it is when the motor misses or performs poorly to take the *AC Plug Kit* and change

the plugs, instead of losing time to locate the missing cylinder. Then at his convenience he can clean and test the removed plugs and put them back into the *AC Plug Kit* ready for future use.

This will enable you to sell in sets of not less than four AC's and to greatly increase your spark plug sales.

Tremendous publicity will be given to this *AC Plug Kit* through continued national advertising, so get in your supply and be prepared to go after this business.

AC Plug Kits will cost you nothing—ask your jobber's salesman or write us for particulars.

This is another link in the AC merchandising chain. Have you the AC signs, transparents and other sales helps to connect you with it? If not, drop us a line for prompt action.

AC Spark Plug Company, FLINT, Michigan

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

Cooper Products

TIRES BATTERIES

If you want to make
money twelve months
a year instead of the
irregular seasonal spurts

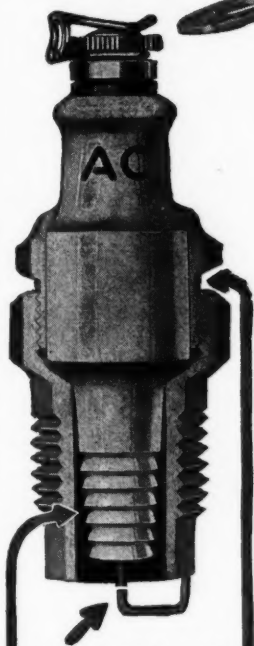
*(Write or wire for the
Cooper Dealer Plan)*

This year 'round selling
plan has been worked
out by experts in both
tire and battery sales. It's
a REAL success and this
is your chance to share.

THE COOPER CORPORATION

General Offices
CINCINNATI, OHIO

Spring terminal clip permits wire to be instantly detached and reconnected while motor is running. Facilitates testing spark plug and coil. No nut to be unscrewed or lost



New electrode design forms a natural drain so that no oil can lodge in spark gap

Unscrew this bushing and plug comes apart. Notice compact porcelain to withstand hard service

Patented CARBON PROOF porcelain with its high temperature fins attains sufficient heat to burn oil deposits, thus offering effective resistance to carbon

AC 1075 Special for Fords



The AC Plug Kit
—to carry spare plugs

The Market for AC 1075 is the Largest in Your Community

The market for AC 1075's is the largest in your community because of the large number of Fords in operation and the chance it gives you to sell complete sets of AC 1075's to replace worn-out and incorrectly designed plugs.

Ford engines, just as much as others, need the best plugs because a good spark in each cylinder is a necessity in any engine.

AC's answer to the need for a better plug for Ford engines—cars, trucks and tractors—is the now famous AC 1075.

No Ford owner is interested in changing brands unless he gets better plugs.

Experience has taught him the faults of all ordinary plugs and he can see at a glance that the AC 1075 is designed and built to correct these shortcomings.

When the Ford driver asks for a plug place the *AC Plug Kit* before him, containing four AC 1075's, and point out to him that probably what he needs is a new plug in each cylinder to be assured of a better running motor. Show him how convenient it is when the motor misses or performs poorly to take the *AC Plug Kit* and change the plugs, instead of losing time to locate the missing cylinder—then at his convenience he can clean and test the removed plugs and put them back into the *AC Plug Kit* for future use.

This *AC Plug Kit* is something every Ford owner has always wanted. You can offer them these free with a set of AC 1075's—the kits cost you nothing—ask your jobber's salesman.

This will enable you to sell in sets of not less than four and to greatly increase your spark plug sales.

Thousands of dealers are fast building a big, profitable spark plug business on AC 1075's. Our advertising is constantly placing it before the Ford owner who is already impressed with AC quality.

AC Spark Plug Company, FLINT, Michigan

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

The Standard Spark Plug of the World



Arrow Head

FIT



Arrow Head Axle and Drive Shafts fit perfectly because of the absolute precision with which they are made to specifications. This insures prompt and easy installation. They are machined from steel specially developed for us and guaranteed to have a tensile strength of at least 125,000 lbs.

The "Arrow Head" is Your Guarantee

Products



PRODUCTION

Arrow Head products are made in the largest factory in the world devoted to the exclusive manufacture of Pistons, Piston Pins and Axle and Drive Shafts. This, combined with specially designed machinery and expert operatives, is what makes their superior quality possible.



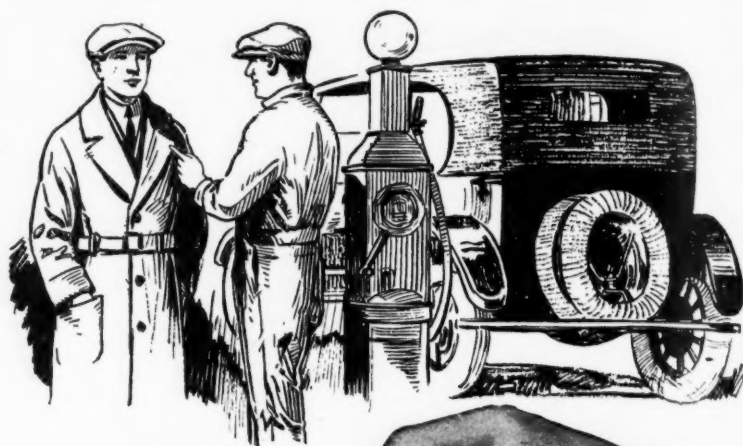
ARROW HEAD STEEL PRODUCTS CO.
MINNEAPOLIS, MINNESOTA

General Sales Offices,
616 S. Michigan Ave.,
Chicago, Ill.

Let "Arrow Head" be Your Business Builder

"I'll Tell You How to Get More Mileage Per Gallon"

Motorists appreciate such friendly tips and thousands of seasoned motorists and experienced garage men will assure you that the Cooper Special Motor Testing and Carbon Outlet Valve increases mileage, cuts both fuel and oil consumption because it gives a free exit for the carbon that otherwise fouls the motor or clogs the muffler.



Patent Applied for

\$250

Cooper Dash Control

Gives instant and complete control of Carbon Outlet and Testing Valves, exhaust heater valves, air chokes, radiator shutters. Right at your finger tips, always in sight of driver, fits the hand perfectly; a twist of the wrist locks it in any position. The Cooper Dash Control does not interfere with levers, pedals or floor board—a feature liked particularly by men who service batteries. Installed by cutting half-inch hole in dash. Made of brass, polished and nicked—an ornament to the finest car.

Prices

Valve Only

1½ in.	\$2.50
1¾, 1¾, 1¾	3.00
2, 2½	3.50
2¾, 2¾, 2½, 2¾	4.00
2¾, 2¾, 3	5.00

Cooper Valve complete with pedal for Fords \$3.00

When "Cooper Special" Valves are ordered complete with Dash Control, add \$2.50 to above prices. Add 10 per cent to these prices on Pacific Coast. Ask your dealer. Dealers ask Jobbers.

The Cooper SPECIAL Motor Testing and Carbon Outlet Valve

The "Cooper Special" also saves repair expense by giving you a timely warning of impending motor trouble, and helps locate the difficulty quickly—It lets you "listen in"—and the motor "speaks for itself."

A "Cooper Special" Valve can be installed in thirty minutes. It is not necessary to cut exhaust pipe in two, simply cut an oblong hole and fit the Cooper around it. Strong spring and heavy rod axles keep the flapper from chattering—not affected by heat, mud or rust—nothing to get out of order. There's a size for every car. Standard equipment on Paige Daytona and other fine cars.

Manufactured by

Cooper Mfg. Co.

Dept. 15-C

Marshalltown, Iowa

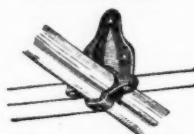
Sales Representative

The Fulton Company

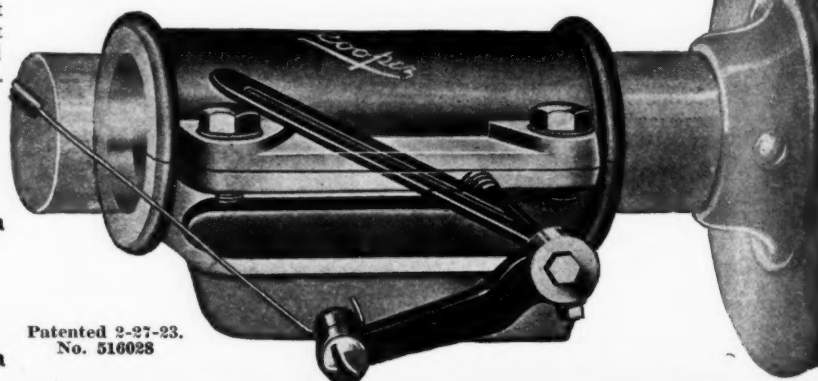
Dept. 15-C

Marshalltown, Iowa

Cooper Steering Column Support for Fords

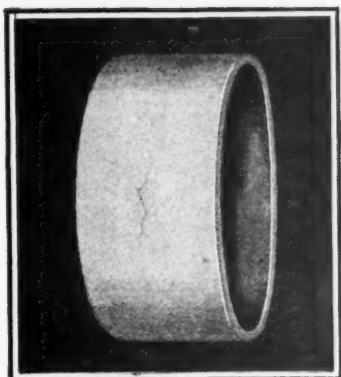


Holds steering column absolutely rigid. Takes out all vibration from steering wheel. Adds greatly to comfort of driving, especially over rough roads. A strong casting, black finish. Fits all Fords having instrument board, both open and closed models. Packed in individual cartons. Price 75c.

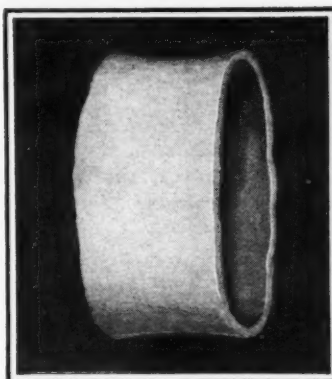


Patented 2-27-23.
No. 516028

Slick side out! ~ or right side out?



Section of Hanes Red Inner Tube. Note straight top and base lines. No strain. Tube is made the natural way. It is as good 5 years from now as today.



Section of ordinary smooth or "slickside" tube. Notice how tension (due to tube being turned inside out by makers) causes the edges to curl. This tension shortens the tube's life.

Facts about the making of inner tubes that will make a good many dealers sit up and take notice

PICK up any old tube around the shop. Run your hand over its smooth surface. Nice and slick feeling, isn't it? Sure, but now take out your pocket knife, cut out a section about an inch and a half wide. Turn it inside out. Just feel the difference. Not so smooth, is it? This smooth tube of yours was turned slick side out (inside out) by its maker to save time, cut costs, speed up production, and hide any poor workmanship.

Now turn the smooth side out again. See how the edges curl up! Tension does that. In every inner tube having the slick side outermost the rubber is under a small but constant tension which eventually leads to cracking, first on the edges where the tube is folded, then elsewhere. That's the cause of tubes going "bad" on your shelves. That's why customers kick about your service and make friends with your competitor.

The workmanship on Hanes Inner Tubes is so

good that there is no need to turn the slick side out. The tube is left in its natural position. For this reason Hanes Tubes grow tougher as they grow older. Time does not impair their fine quality.

Then, too, Hanes Inner Tubes are not spliced like the ordinary kind. Instead of being cured by the acid splice method (which can only be repaired on or near the splice by a cold patch) the ends of the Hanes Tubes are spliced together by an individual steam vulcanizing process. So if Hanes Tubes are punctured on or near the splice they can be repaired in the same manner as if the damage occurred in a less delicate portion of their "anatomy." You know how rare a feature this is.

We aid you to sell Hanes Tubes and Hanes Cords by a strong local newspaper campaign which we pay for. If this is the sort of co-operation you are interested in, drop us a line.

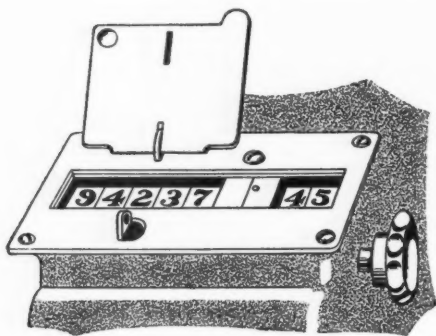
HANES RUBBER COMPANY

Winston-Salem, North Carolina

HANES RED TUBES

The High Water Mark in Tube-making Skill

BOWSER



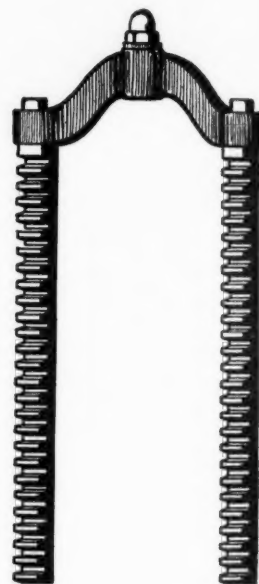
The one meter that's always accurate

Part by part, and piece by piece, Bowser gasoline pumps and oil-handling outfits are the finest made today.

Bowser pumps have double cog-racks, cut-steel gears, built-in meters of watch-like precision, paint finish that stays on.

Check these items yourself and you will see why Bowser performs so well.

Write today for folder A-14, and let us tell you why you will get more service from Bowser-quality pumps.



The cog rack that keeps a Bowser Pump always easy-running.

S.F. BOWSER & COMPANY, Inc.

Pump and Tank Headquarters

FORT WAYNE, INDIANA.

Sales and Service Offices and Representatives Everywhere

TANKS **DEPENDABLE** PUMPS

BOWSER
1885



Send for this gasket

**It's FREE—to every dealer and
garageman who sells or uses Never-Leak Gaskets**

SIMPLY write your name and business address on the tag printed above, tear the tag out and mail it to us. For your trouble you will receive a new Never-Leak Bound Edge Gasket—any type or style you choose.

**Our purpose in asking for
your name and address**

Once your name has been added to the Never-Leak Roster, at a certain time each month, the mailman will

bring you new ideas in boosting gasket sales and show you how to encourage replacements where they are needed. This will increase the rate of your gasket turnover and, proportionately, your profits.

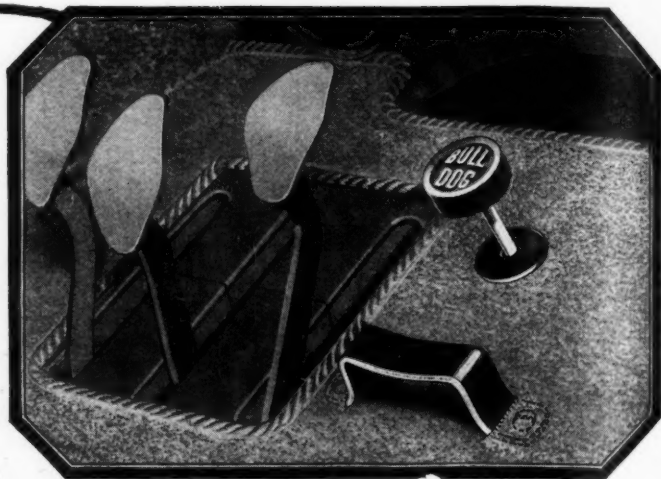
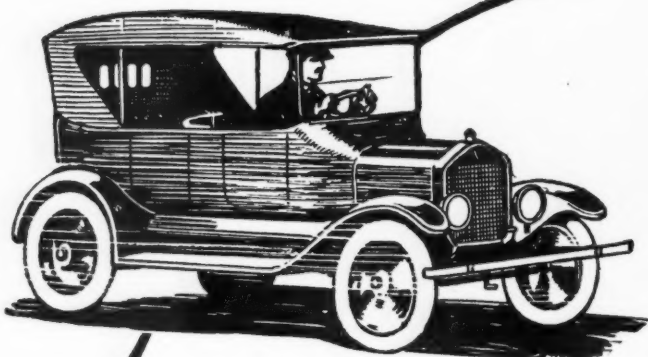
Our free service will also include many other timely hints on gasket preferences, uses and sales—giving you an advantage well worth while over the fellow down the street.

Get your name on the list—NOW.

THE FITZGERALD MFG. CO.

TORRINGTON, CONN.

NEVER-LEAK Cylinder Head Gaskets



"Bull Dog" Foot Accelerator
\$1.50 Buys It

Every Man Who Buys A Ford Wants A "Bull Dog"

As Sure As He Wants Gas

Even if a man had three hands, the throttle lever would not give as smooth steady operation as the "Bull Dog" foot accelerator. Just when you want a quick spurt of power, both hands are needed on the wheel for safety's sake. It is not good practice to race the motor, yet when the emergency stop is made the motor is bound to race unless you have a Foot Accelerator to give instant control of power. There are many advantages in the "Bull Dog," but you can sum them all up in saying "It makes a Ford drive like a big car"—and at a cost of only \$1.50.

This low price means rapid turn-over, quick profits as thousands of dealers can testify.

The rubber covered pedal is an exclusive feature of the "Bull Dog."

The foot rest holds the motor speed steady without tiring the foot.

The floor mat binder keeps the floor mat from raveling.

Favorable discounts and Jobbers stocks at convenient points mean small investments and fair profits.

Manufactured by

THE W. H. THOMAS MFG. CO.

404 W. Sixth St., Spencer, Iowa

Sales Representatives

THE FULTON COMPANY, MILWAUKEE, WIS.



Only \$1.50
Complete

"Bull Dog"

FOOT ACCELERATOR *for* FORDS



Reproduced through courtesy Motor Age—March 15th.

How to Install the Flat Rate System

MORE MONEY in the flat rate—

IF you sweep out old-fashioned wasteful methods and bring in EFFICIENCY.

In grinding compounds, efficiency means PEP WATER-MIXED, for it grinds valves and laps pistons in LESS THAN HALF the time of any grease-mixed compound and does a BETTER JOB.

PEP Bearing Grinding compound is another thing the flat-rate shop can't AFFORD to be without.

Don't WONDER if the PEP compounds will save you money! Send in this coupon for FREE SAMPLE—now, before you turn the page, and find out by EXPERIENCE.

Over 500 Jobbers sell PEP.

All Jobbers can get it for you.

PEP MFG. CO., Inc.

33 West 42nd St.

New York, N. Y.

Tear off and mail today—don't put it off
 Pep Mfg. Co., Inc., 33 W. 42nd St., N. Y.
 Check free sample wanted
 Pep Valve Compound ☐
 Pep Bearing Compound ☐
 Write name and
 address in margin in
 pencil
 MA-4

**Guaranteed
1000 miles
to the
Gallon of Oil**

**A guarantee that
will build sales
for you**



Your customers will be quick to have new rings installed when you offer them a guarantee of 1000 miles to the gallon of oil, or their money refunded—a guarantee that we stand squarely behind.

Sav-Oil oil rings have *proven* their dependability over long periods of time, in different makes of cars, and with all brands of compression rings.

Sav-Oil rings are one piece, cast individually from the highest quality soft grey iron, carefully machined and each one inspected. They "mike up" uniformly—insure proper lubrication and prevent oil pumping. Sav-Oil is stamped on the bottom of every ring.

Install only *one* per piston—that's why you can do a large volume of business with only a small investment in stock. The turnover is all the faster too, and the discounts are liberal.

Send for an assortment of sizes — sell them with our positive guarantee—and watch the *results*.

Sav-Oil Guarantee

We positively guarantee SAV-OIL Piston Rings to give you 1000 miles to the gallon of oil or your money refunded, provided they are installed according to our directions and your cylinders are not scored or out of round to exceed .005 inch.

\$1⁰⁰ List

up to 4"
4" to 5" \$1.25

Territories Open for Distributors

The Sav-Oil Ring Mfg. Co.

1037 So. Figueroa St.

Los Angeles

Sav-Oil Piston Ring Co.
2056 Jackson Blvd.
Chicago, Illinois

H. W. Blevins
1532 Grand Ave.
Kansas City, Mo.

Sav-Oil Ring Mfg. Co.
550 Golden Gate Ave.
San Francisco, Cal.

C. H. Mountjoy & Co.
211 Third St.
San Antonio, Texas

LINCOLN



Accepted from Coast to Coast

So rapid has been the success of Lincoln Shock Absorbers that they are now demanded throughout the entire country.

Their fast action snubs every rebound, making any car ride smoothly and comfortably.

The strength and simplicity of Lincoln construction makes them far more satisfactory, both from the car-owner's and the dealer's point of view.

Six sets fit all cars, \$15 to \$36. Lineolns can be installed in an hour's time.

FOR ALL CARS

LINCOLN PRODUCTS COMPANY
1253 South Michigan Avenue, Chicago

SHOCK ABSORBERS

Kingston

The KINGSTON line for 1923 embraces not only the best but the handsomest carburetors that the world's largest carburetor factory has been able to produce in the quarter century of its existence. All of the Kingston De Luxe line carburetors are of brass construction, all are equipped with Kingston Steering Column Control, and with the new type compact brass fuel strainer. They are attractively boxed in special counter display cases in sets of three, and there is a big established demand awaiting the alert dealer. Write for particulars.

THE NEW FORD MODEL

The new all-brass Kingston for Fords, equipped with Steering Column Control and fuel strainer, is one of the big sellers of the season. Not only is the new model made of highly polished brass, but it is finished with utmost care in every detail. Thus the best Ford carburetor on the market becomes also the handsomest on the market. This model, with Steering Column Control attached, is shown in the illustration to the right.

Kingston De Luxe Models are made also for Maxwell, Chevrolet, Overland, Dort and Dodge at \$15; for Studebaker at \$16.50, Haynes at \$20.00, and many other popular priced car models are furnished.

The Kingston line can be had in special display boxes, three to the box, in any combination the dealer desires. Vigorous advertising co-operation is at the command of the dealer. Get in touch with us at once.



Price
\$6.50

STEERING COLUMN CONTROL

The Kingston Steering Column Control, shown attached to the Ford De Luxe Model in the illustration above, is not a choke, but operates directly in connection with the needle valve, with a pull button operating through flexible steel tubing. The pull button is attached to the steering column just below the wheel, handy to the driver. It affords a full 90 degree operation of the needle valve, either for starting or in extreme road or weather conditions, is a splendid all the year around convenience, and saves time, temper, and fuel and motor wear. It is very easily installed, is a part of every De Luxe Kingston, and is a boon to the driver.

BYRNE, KINGSTON & COMPANY
KOKOMO, INDIANA

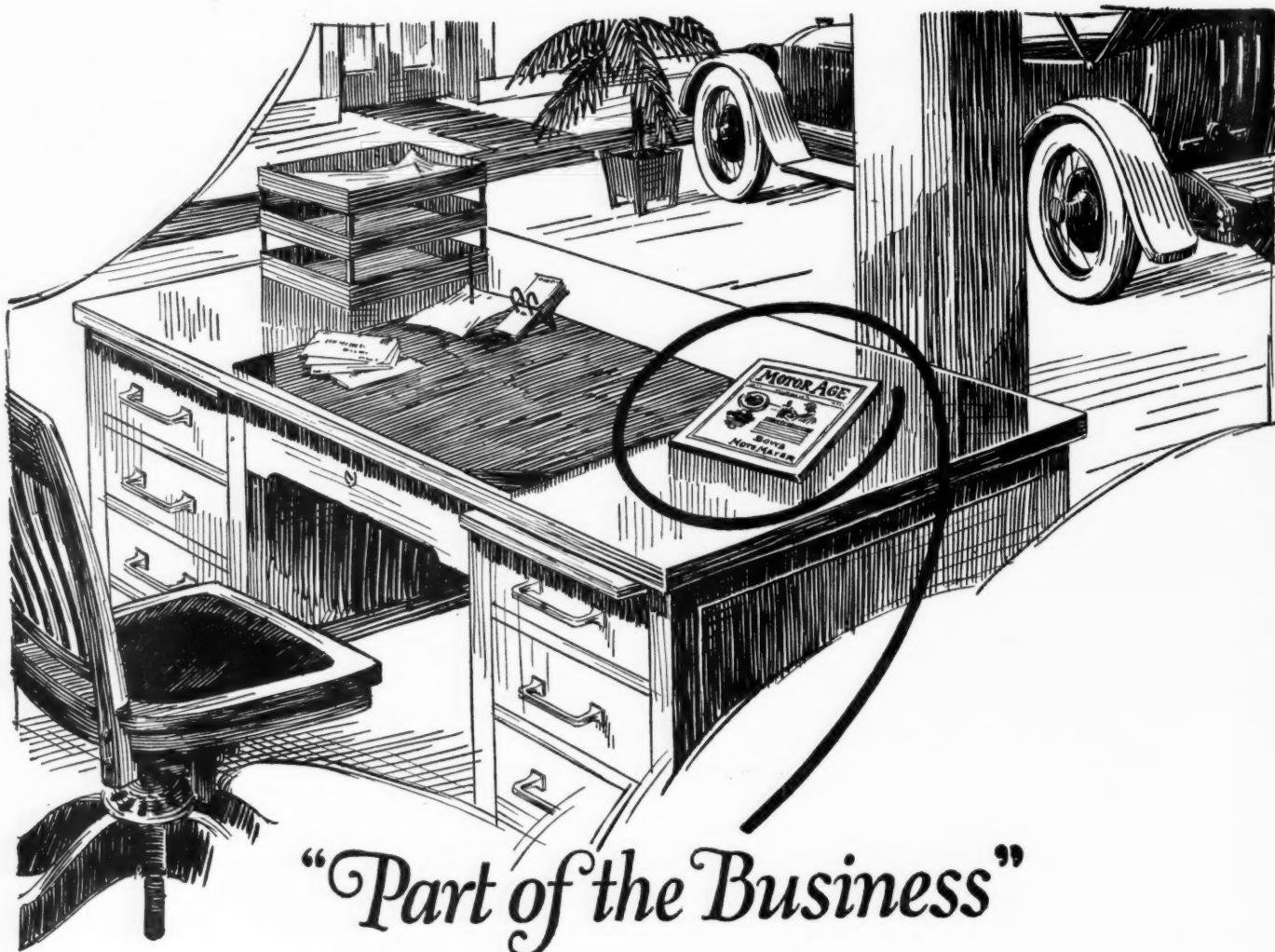
BRANCHES

New York, 245 W. 55th St.
Detroit, 4610 Woodward Ave.

Chicago, 1430 Michigan Ave.
Dallas, 2218 S. Harwood St.

More than
100,000
Cars built by
Durant Motors
have now
been produced
and sold

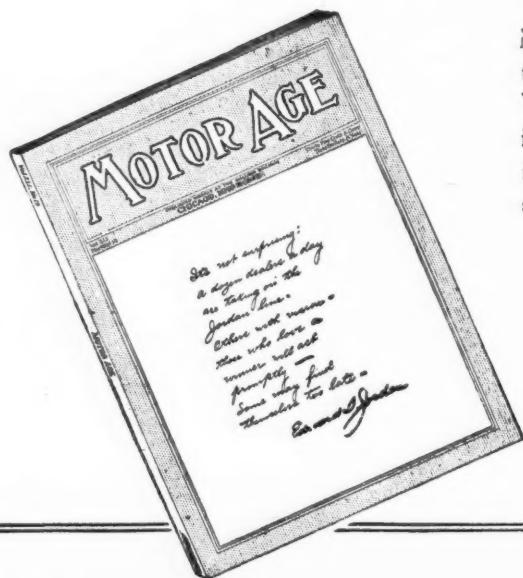
DURANT MOTORS · INC · LONG ISLAND CITY · NEW YORK



"Part of the Business"

IF an automotive merchant could travel through the country asking hundreds of other automotive merchants about their methods of doing business—if he could find out why some businesses have failed and others prospered—if he could hear the personal stories of success from the acknowledged leaders of the automotive trade—if he could do this he would return home a far broader man and a more progressive dealer than when he started. His mind would be filled with new ideas. His enthusiasm would be kindled. And his business would reflect the valuable lessons learned.

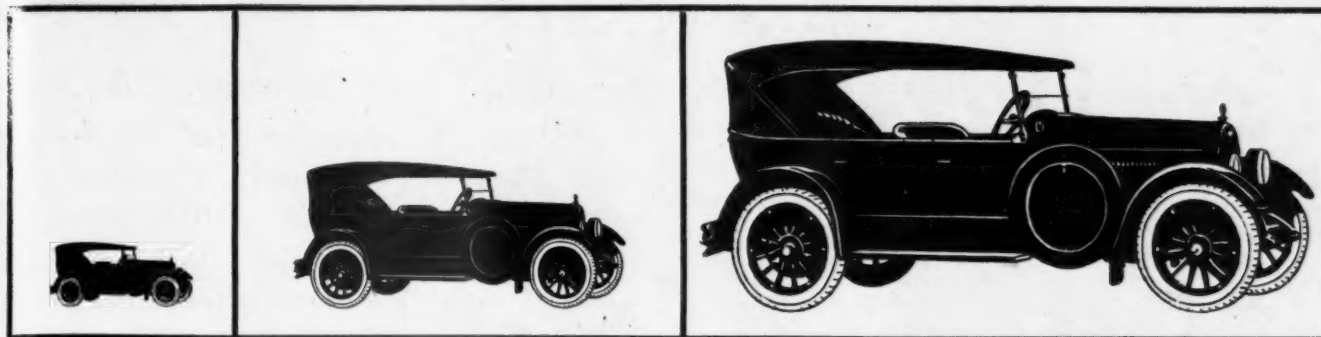
MOTOR AGE is making such a trip possible to thousands of automotive merchants the world over. Yet these men need never leave their desks, for in its columns MOTOR AGE presents information of inestimable value gathered from every conceivable source.



MOTOR AGE

5 S. Wabash Ave.

Chicago, Ill.



**January
Business**

February Business
302% Gain Over January

March Business
318% Gain Over February

Is Your Business Showing Such Growth as This?

There is a concern in the motor car industry whose business since the shows has experienced an unprecedented growth.

Sales for January ran far ahead of every calculation. February showed an increase of more than 300% over January. March sales were 3 times as great as those of February. April orders now on file for immediate delivery indicate a corresponding gain over March.

Is your business showing any such growth as this? Are you still struggling against the stream or are you moving along with the current of public demand?

Are you operating under a franchise that enables you to make money when you *do* sell the cars or does it

impose burdens which eat the heart out of your deserved earnings?

1923 is going to be a determining year. Distributors and dealers who are to survive it must make it a year of unquestioned profit.

The distributors and dealers who were identified with our organization at the start of the year are operating with greater profit than ever before in their history.

Scores of others, sensing the unusual opportunities which an association with our company affords, are making every effort to secure the franchise.

Now is the time to line up with a proposition that will *take you out of the red* and put your business on the right side of the ledger!

Are You the Sort of Dealer We Are Looking For?

We are looking for distributors and dealers who are serious in their intentions to make money in 1923 and lay the foundation for a permanent and reliable future.

We can make a proposition that entails less responsibility and assures greater consideration and co-operation than almost any now available.

Our fair treatment of distributors

safeguards their earnings. We have the resources which make it possible to lift the burdens from the dealer's shoulders.

Our product is right—our facilities the best—our franchise and discounts the most liberal imaginable—our protection against price declines absolute—and we have a name in the industry and a reputation with

the public that is the equal of any.

We are looking for real Business Men, keen enough to appreciate the value of a connection with us—men who have the acumen to cash-in 100% on the opportunities we place in their hands—merchants who are in this business to stay and have the capacity to develop with us.

16 Reasons Why We Guarantee Profits

How long will it take you to put your present business on a paying basis? How much more could you earn in the same length of time with a proposition that enables you to start showing a profit right from the start?

If you are operating with a profit now, how much more could you add to your earnings with a proposition that would require little or no additional responsibility or investment but would enable you to get that business which you now are forced to see go across the street or around the corner?

Our line will fit in with whatever you now may be selling that is not in direct competition. If your present line is competitive, perhaps the more

reason for investigating this extraordinary proposition of ours.

There are 16 reasons why we can guarantee profit—16 reasons why merchants who have analyzed our proposition regard it as the *fastest growing opportunity in the motor car business today*.

There is not an unassigned territory in the United States which does not offer a rich field for those who secure our franchise, for making more money with less responsibility and a bigger future outlook than almost any other account now available.

Do you want to grow with us? Write us and we will give you the names of some of the "One-of-a-Thousand" dealers who are selling our line and can tell you about it.

All Applications Held in Confidence

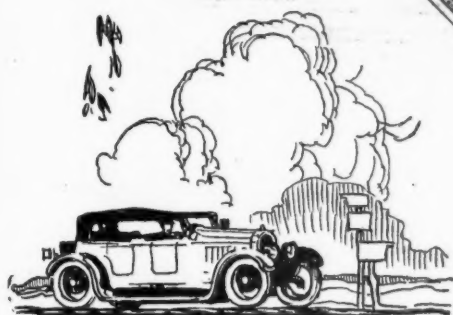
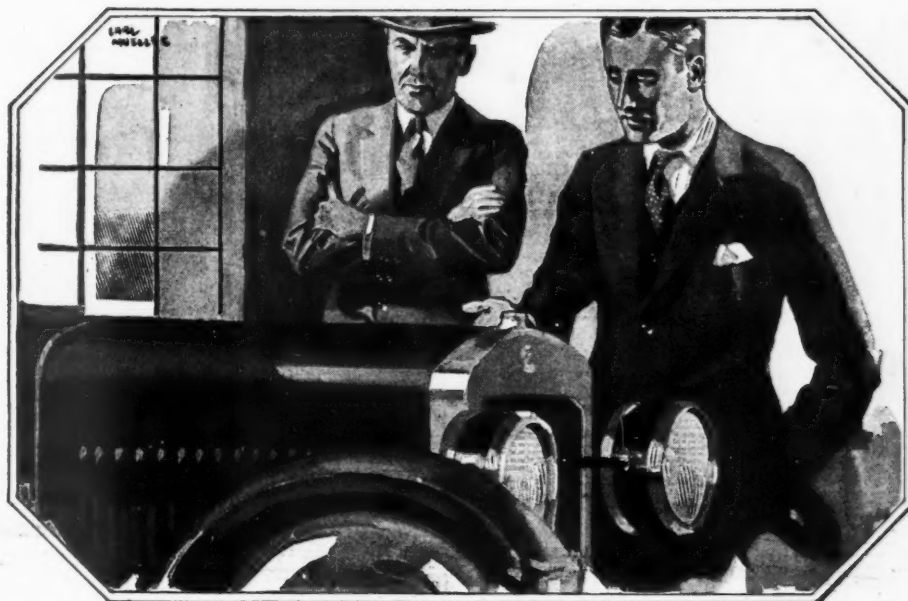
Address Communications to

Box E-6059

MOTOR AGE, 5 S. Wabash Ave., Chicago, Illinois

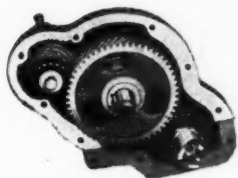
We are so confident of our ability to interest the right kind of dealers that we will stand all expense of a trip to the factory for a thorough investigation

A new car, to the prospective buyer, means a quiet car



To car owners

Your service station or repair man knows how to banish noise from your timing gear case. He can put Celoron Silent Timing Gears in your car. It isn't a long or expensive job. Then you will ride in comfort.



He is thinking with his ears

NOISE in the engine brings worry to the motorist. The lightest knock, the slightest grind, and he imagines at once scored cylinders, burnt bearings, bent connecting-rods, all the ills of which noise may be the symptom.

The first sound from worn all-metal timing gears may be a small matter, but it rapidly becomes a serious irritation.

In time, the snarling grind of the gears destroys the driver's peace of mind. It shouts in his ear, "Something's wrong! Can you fix it? Is it safe to go on? Is it harming the engine?"

The timing chain stretches with wear until the motor is out of time. Then a long and expensive tear-down, and a new chain must be installed.

Celoron Silent Timing Gears are non-metallic. They are water-, grease-, and oil-proof. They are as tough as steel.

Celoron Silent Timing Gears are resilient. They absorb shocks, and lengthen the life of steel mating gears. They retain perfect timing. They remain silent.

Celoron Silent Timing Gears can be used in any timing gear train. They are already standard equipment on many of America's quality cars.

Now, when competition is so keen, margin so close, Celoron Silent Timing Gears will give your car an added sales advantage. Drop us a line for more detailed information. Let us show you how Celoron Silent Timing Gears will help to make your car known as one that stays quiet.

Diamond State Fibre Company

BRIDGEPORT

(near Philadelphia)

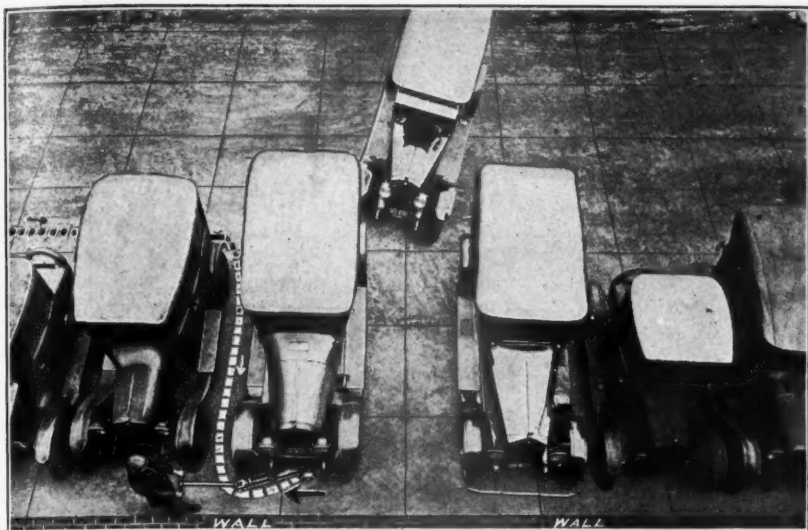
PENNSYLVANIA

Offices in Principal Cities

In Canada: Diamond State Fibre Company of Canada, Limited, 245 Carlaw Ave., Toronto

CONDENSITE CELORON SILENT TIMING GEARS

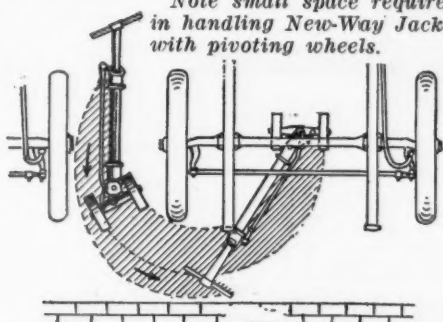
Make Celoron Silent Timing Gears standard equipment on all your future cars



To make room for the incoming car, the car on the left must be moved. Even in close quarters, the pivoting wheels of the New-Way Jack enable it to be quickly steered into position under the front axle.

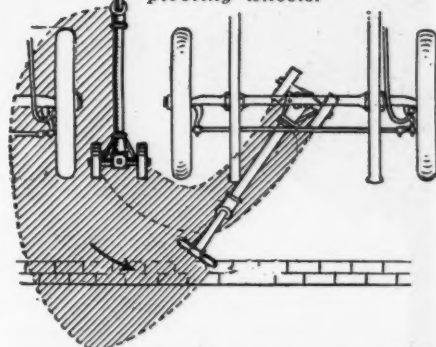
-because the wheels pivot

Note small space required in handling New-Way Jack with pivoting wheels.



Under crowded conditions, as illustrated above, the wheels of the New-Way Jack can be cut to make a sharp turn around the front wheel of the car to be moved and the Jack accurately placed in position without jockeying. Note the small amount of space needed for manipulation.

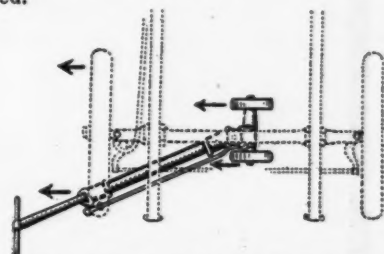
Note large space required for Jacks without pivoting wheels.



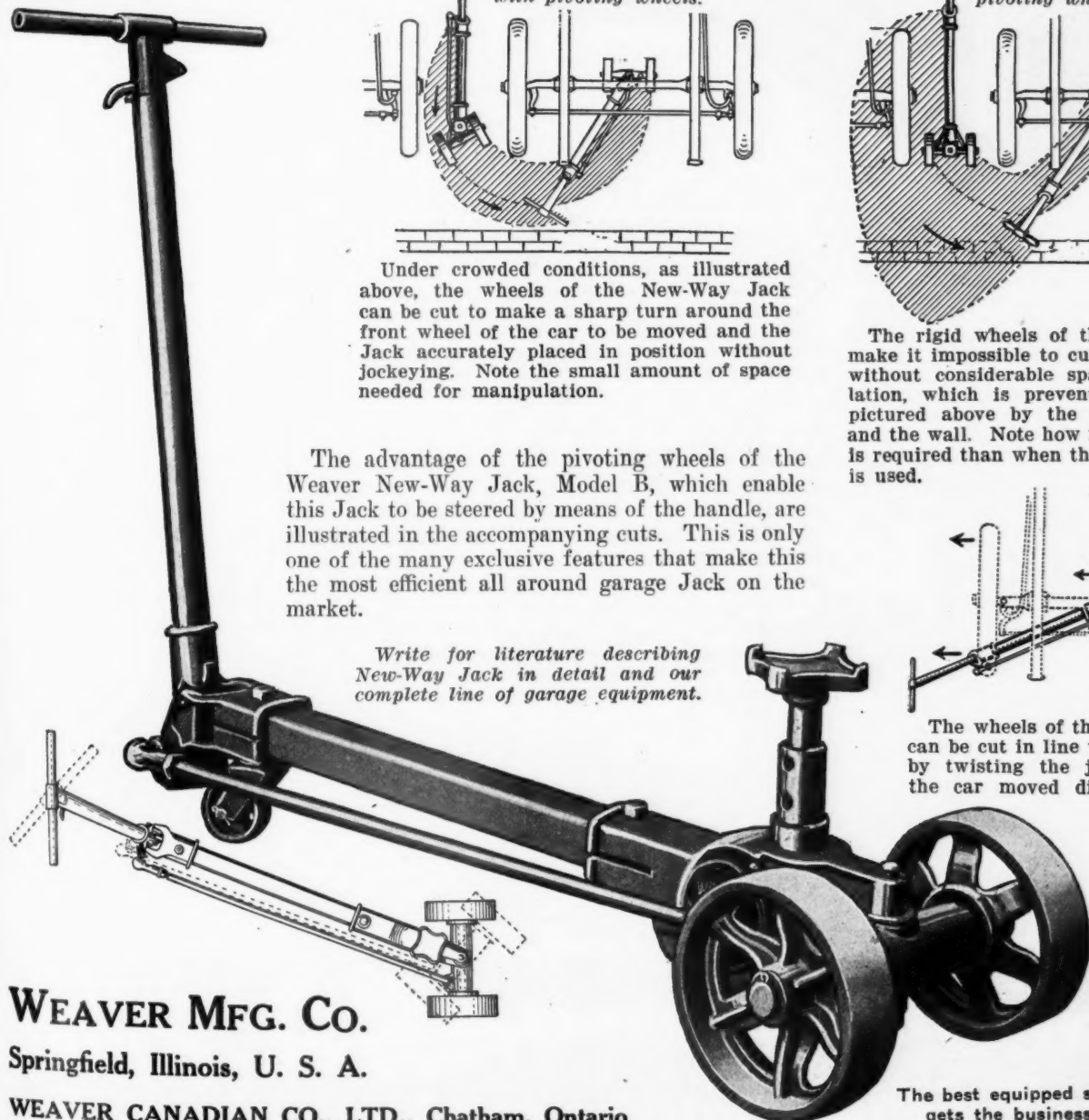
The rigid wheels of the average Jack make it impossible to cut a sharp corner without considerable space for manipulation, which is prevented in the case pictured above by the neighboring car and the wall. Note how much more space is required than when the New-Way Jack is used.

The advantage of the pivoting wheels of the Weaver New-Way Jack, Model B, which enable this Jack to be steered by means of the handle, are illustrated in the accompanying cuts. This is only one of the many exclusive features that make this the most efficient all around garage Jack on the market.

Write for literature describing New-Way Jack in detail and our complete line of garage equipment.



The wheels of the New-Way Jack can be cut in line with the car axle by twisting the jack handle and the car moved directly sideways, instead of at an angle as would be the case if a Jack with rigid wheels were employed.



WEAVER MFG. CO.

Springfield, Illinois, U. S. A.

WEAVER CANADIAN CO., LTD., Chatham, Ontario

The best equipped shop gets the business.





A few of the cars on which Multibestos is factory equipment:

**Pierce-Arrow
Cadillac
Lincoln
Peerless
Wills Sainte-Claire
Dodge Bros.
Maxwell
Winton**

We could tell you many interesting facts about the quality of Multibestos. Yet nothing we might say would be so conclusive as the silent testimony of the many car and truck manufacturers who have adopted Multibestos as factory equipment.

The names appearing above are just a few from the long list of Multibestos-equipped vehicles. But quality is only *one* advantage in Multibestos. In addition, we have developed and offer you the Multibestos Method of relining external brakes in 90 minutes or less, assuring better work, quicker service, and tremendously increased profits.

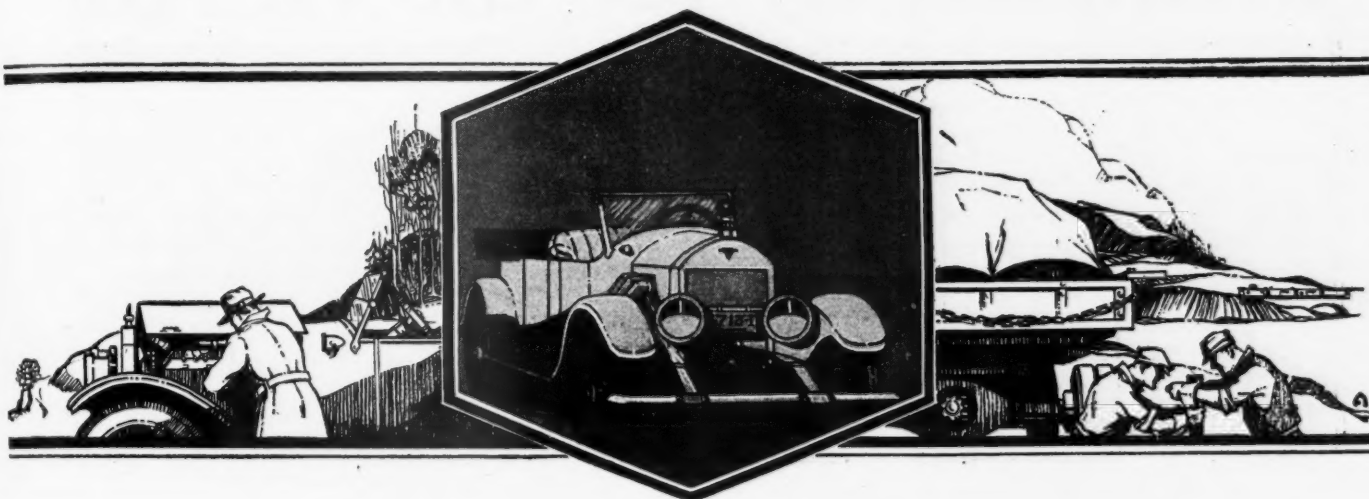
The Multibestos Method together with Multibestos Brake Lining forms a perfect combination with which to build a large, permanent, highly profitable brake relining business. Thousands are doing it. Our free book tells *you* how. Send for it today.

E. C. Miller
Sales Manager, Multibestos Company
Walpole, Mass., U. S. A.

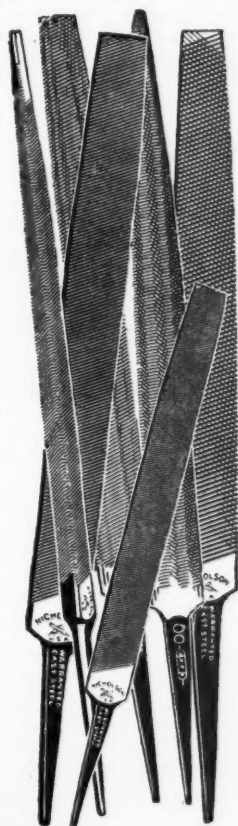
MULTIBESTOS
BRAKE LINING

External brakes relined in 90 minutes or less
by the Multibestos Method

A File for Every Purpose



NICHOLSON FILES



**Have Earned the Confidence
of Mechanics---Everywhere**

When the workman is in harmony with his tools---
good results follow.

From the finely-tempered steel of the file blanks to
the NICHOLSON trade mark on the tang, every
detail in these files merits the confidence of men
who know good tools.

*Nicholson Files are ready-sharp, hence require no
breaking in.*

They are edgholding, hence finish the job they start.

They cut faster and smoother, hence conserve energy.

*And they are accurate, therefore time-saving and
worthy of the confidence reposed in them.*

Be sure your shop is equipped with the proper assortment of
Files for automotive maintenance and repairs. There's a
NICHOLSON File (or rasp) for every purpose. And the
NICHOLSON trade mark on the tang is your guarantee of
a dependable tool.

NICHOLSON FILE CO.

PROVIDENCE, R.I., U.S.A.

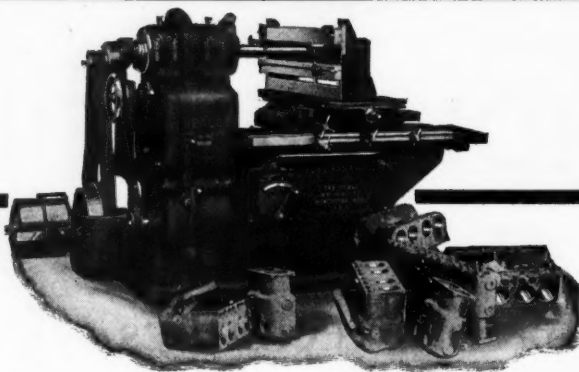
Repairmen and Motor Owners Unanimously for the HEALD

THE REPAIRMEN choose the Heald for its economy in producing the highest grade of work. The Heald Universal Jig permits quick set-ups and accurate location of the cylinder bloc regardless of size or type. Simplicity of control eliminates lost motion and accurately graduated dials supplant guesswork. Every factor for cutting time from floor to floor is incorporated in the design and the minutes saved on every bloc show in dollars in the day's profits.

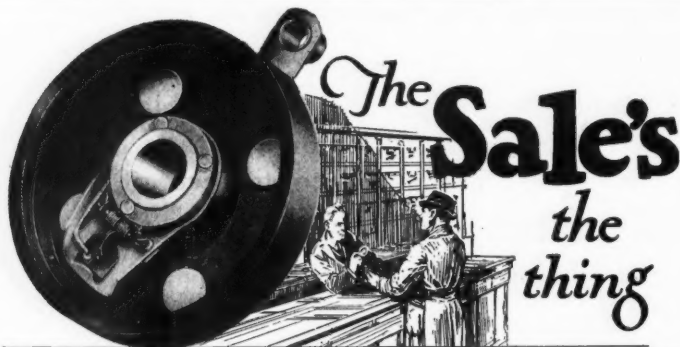
THE CAR OWNER demands Heald regrinding because of its efficiency and economy. A Heald-ground cylinder is as perfect as mechanical means can make it. 90% of all motor manufacturers finish their cylinders by grinding and use Heald machines exclusively. Naturally the owners will want the same grade of finish when regrinding in order to maintain the high standard of their power plant.

If you are considering this work, visit several regrinding shops, get in touch with the manufacturers themselves, and finally question various motor owners as to what equipment they advise to handle this work so as to bring you ultimate success. Let us send you convincing literature or even give you a personal call. No obligation. Glad to do it.

**The Heald
Machine Co.**



**61 New Bond St.
Worcester, Mass.**



A Good Timer Is Bound to Sell Fast

And this is good and sufficient reason for handling the Bell—the timer that is winning the approval of Ford owners all over the country—and is becoming more and more popular with dealers every day.

The Bell self-adjusting contact shoe assures perfect timing under all conditions. Wear, cam shaft end play and other motor and road disturbances are compensated for.

Bakelite case. Dirtproof. Dustproof. Waterproof. Uninterrupted service is assured.

Details on request.

A special effort is being made to open choice territory for our jobbers and dealers. Have you learned the details of our proposition? If not, write today.

Bell Manufacturing Co.

11 Elkins St.

Boston, Mass.



WITH the Bell Rotor, perfect contact and accurate timing is inevitable. A special spring bears against the contact shoe, and if there is any end play of the cam shaft the spring coils automatically wind and unwind — maintaining a constant even pressure on the raceway. Send for illustrated descriptive data.

List Price \$3

The BELL Timer

The New Stewart 1-Ton Truck

Bodies
for
Every
Business



New Stewart 1-Ton Truck, With Body and Complete Equipment as Illustrated, \$1185, F. O. B. Buffalo

FOR
\$990
CHASSIS

Matches Trucks Costing up to \$1800

*Alters All Truck Values—
A Simple Way to Prove It*

*A Few of the Many
Units in the Stewart
1-Ton Truck, Which
Equals Those Used by
Far Costlier Trucks*

*Liberal Discounts to Deal-
ers in Small Towns*

The new Stewart 1-Ton Truck alters the whole scale of truck values.

Point for point it equals or excels trucks costing \$1500 to \$1800. Just check the specifications.

With body and complete equipment it costs less than the chassis alone of many 1-ton trucks, which it will out-perform and outlast.

Good territories are open. It is a money-maker that dealers can handle with no large capital. Automobile dealers can sell it in connection with their present business with no increase of overhead.

It is the biggest opportunity for years in the truck field. Write for particulars, today.

Disc steel wheels—Demountable rims. Non-skid cord tires, 34" x 4½"

Motor—5-bearing crank shaft. Pressure feed lubricating, automatic control. Removable cylinder head and block. Matches motors of trucks costing up to \$1800

Clutch—7 dry plate, multiple disc type with automatic adjustment. Same as in trucks costing up to \$1750.

Axles—Front, I-beam, drop-forged. Rear, spiral bevel gear, heavy Brown-Lipe differential. All Timken roller bearings. Equal to trucks costing \$1800.

With carburetor, Remy ignition, starter, generator, Gemmer steering. All found in trucks costing \$1500 to \$1800.

Cooling—Cellular type core, pressed steel shell. Extra strong chassis frame, 6" at greatest depth. Equals trucks costing \$1400 to \$1750.

Backed by 10 Years of Successful Truck Manufacture and Financial Stability

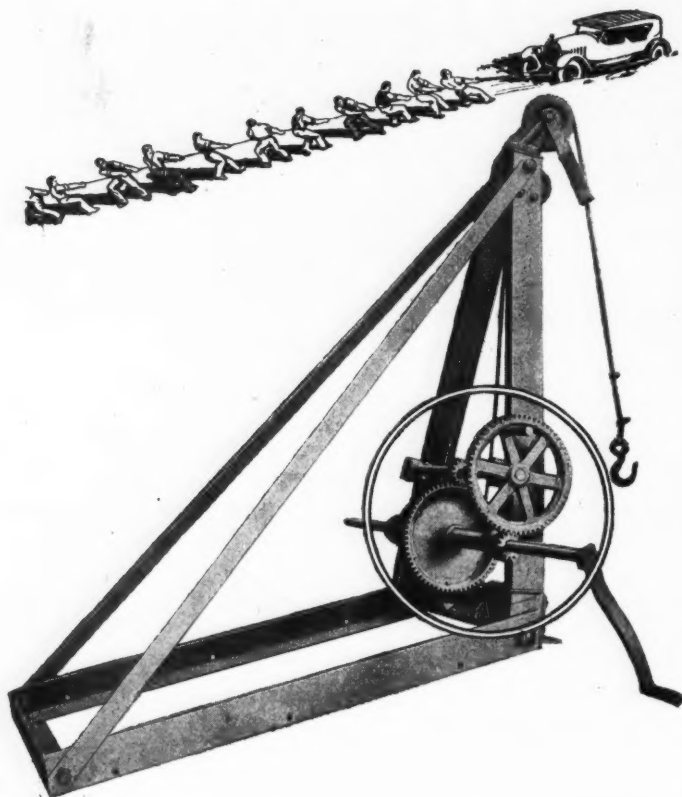
Write or
Wire Today

STEWART
MOTOR CORPORATION Buffalo NY

Other Sizes
f. o. b. Buffalo

1¼ to 1½ ton	\$1495
1½ to 2 ton	1870
2½ to 3 ton	2590
3½ to 4 ton	3440

The Power of 21 Men



Within the circle is a gear train of 21 to 1 reduction, enabling one man to exert the pull of 21 men. Ordinarily no blocks are needed, so the whole length of the 50-foot steel cable may be used to reach over bluffs, into fields, or beyond obstructions. When block is used, power is doubled, and length of cable halved. There is room for 100 feet of cable on the drum. The safety ratchet cannot release until both hands are on the crank. The crane's capacity is three tons.

*When writing,
specify*

Ernest Holmes' Crane Wrecker

The Ernest Holmes Co.
Chattanooga, Tenn.

Adjustable tie rods give variable overhang with maximum strength.

Gears machine cut of steel and bronze.

Full floating drive shaft in bronze bushings. Crank fits both ends.

Strain of cable falls on extra heavy tube-axle, relieving drive shaft of bending stresses.

Long axles distribute stress all over frame of car.

Can be equipped with electric drive in ten minutes at moderate cost.

Swivelled head permits side pull without slewing car across road.

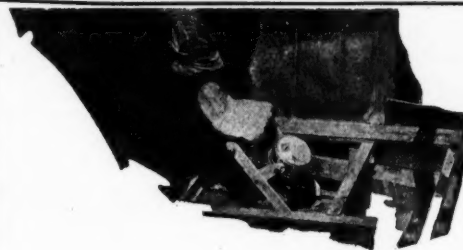
Permanent handle on second gear quickly adjusts length of cable.

Whole controlled while standing on ground in one spot. No climbing in or out.

Profits running from \$100 to \$500 easily made.



FINDS THE WEAK CELL



—without taking
battery out of car

A HOYT Cell Tester will save you lots of time, for when a patron drives up and reports battery trouble, you don't have to waste many precious moments fussing with various instruments, meters, etc., to find the weak cell.

Take the Hoyt Cell Tester, place its two sharp steel prods, one on the positive, the other on the negative terminals of the individual cells—and read direct. It makes a positive contact and you can tell the condition of the battery cells at a glance.

A Hoyt Cell Tester in your shop gives the kind of accurate, speedy service that will please both you and your patrons.

Our new edition of "Hunting Down Electrical Troubles," describing this repair shop necessity, and other Hoyt instruments will be sent on receipt of ten cents—to cover postage.

THE BURTON-ROGERS CO.

Sales Department—Hoyt Electrical Instruments
755 Boylston Street, Boston, Mass.

Hoyt Instruments May Be Purchased From Your Jobber
Branch Offices and Distributors in all principal cities

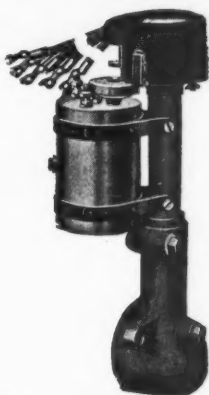
**"The Best-Equipped Shop
Gets the Business"**



Here is the Line the Motorist Wants

The Kokomo Electric line has been on the market for twenty years. Every motorist knows the line for the correctness of design, the staunchness of construction and the all-around dependableness of every item. Dealers everywhere find Kokomo Electric Company products their best and steadiest sellers.

The Kingston Battery Ignition System *for Fords*



A high-class ignition system similar to that used on the highest priced cars. Completely wipes out all commutator trouble resultant from dirty contacts and uneven wear, and obviates annoyance from loose oil-soaked wires, or wires with raveled insulation. Strictly high class, fully guaranteed, easily installed.

Price, complete, \$20.00

The Handy Carburetor Adjuster



Another great all the year around seller. With pull button installed on steering column, just under the steering wheel, a full one-third turn of the carburetor needle may be made. Easily installed, nothing to get out of order, and will actually save its cost in gasoline in a short time. Makes starting and driving easy.

Price, complete, \$1.50

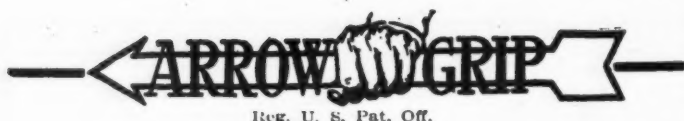
KOKOMO ELECTRIC COMPANY, Kokomo, Ind.

NEW YORK: 245 W. 55th St.
DETROIT: 4610 Woodward Ave.

BRANCHES:
BOSTON: 15 Jersey St.

CHICAGO: 1430 Michigan Ave.
DALLAS: 2218 S. Harwood St.

KINGSTON



PREPARING FOR THE PILGRIMAGE

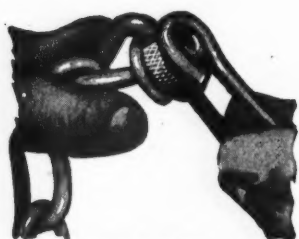
East, West, North and South, motorists everywhere are taking stock of winter's wear and tear on their cars, for the merry motor pilgrimage will soon be swarming on the nation's roads.

They'll need new equipment. They'll be asking for advice.

Your interest, Mr. Dealer, lies in giving them the best of both.

ARROW GRIP MOTOR NECESSITIES

Will keep you and your customer smiling.



CHAINS

For Pneumatic Tires

The non-skid chain with the handy Cross Chain Fastener. Motorists welcome the ease and rapidity with which cross chain replacements can be made. A turn of the button releases broken chain; another turn fastens new one securely. Only short length of chain needed for replacements. Fasteners also sold separately for use with other chains.



JACKS

Handle Controlled

The Jack that takes all the irritation out of road mishaps. Easily operated from a standing position. A few easy turns of the handle raise or lower the car. No sudden drops, no pumping, no grease smeared hands or clothes. Two sizes fit all cars and trucks. Handle folds compactly and entire jack packs away in small space.

RAPID SELLERS—WORTH WHILE PROFITS

Ask Your Jobber or Write for Literature

ARROW GRIP MFG. CO., Inc.

GLENS FALLS, N. Y.

Export Office: 280 Broadway, N. Y.

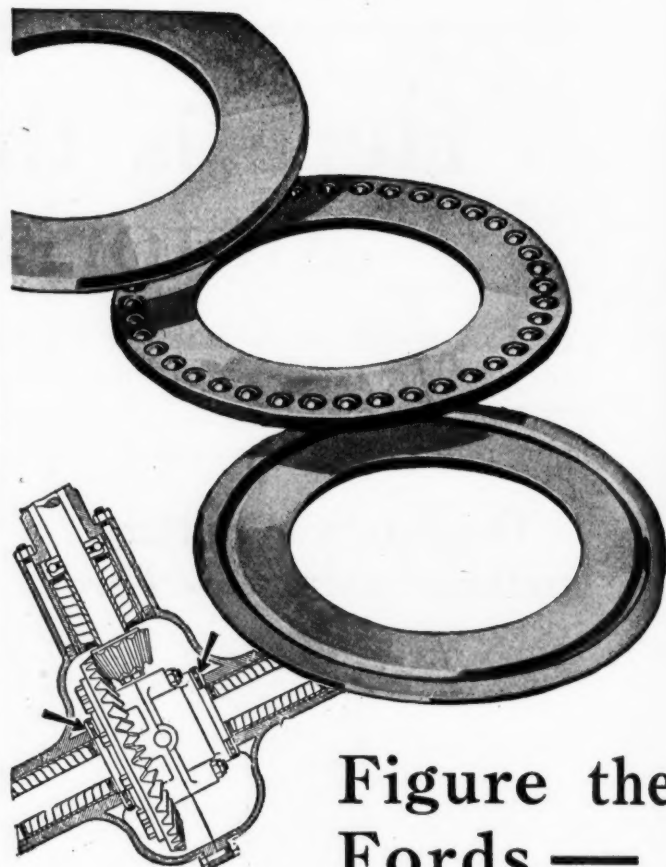


Figure the Fords — Figure your profits!

4,850,000 Ford passenger Cars now registered—and every one needs a pair of Bantam Ball Bearings, F-40.

Ford Cars have only plain washers in the differential. Replace these with Bantam F-40 and reduce friction to a minimum. Result—more mileage—less wear—longer life.

Your distributor carries F-40. If he cannot supply you, write direct to one of the addresses below:

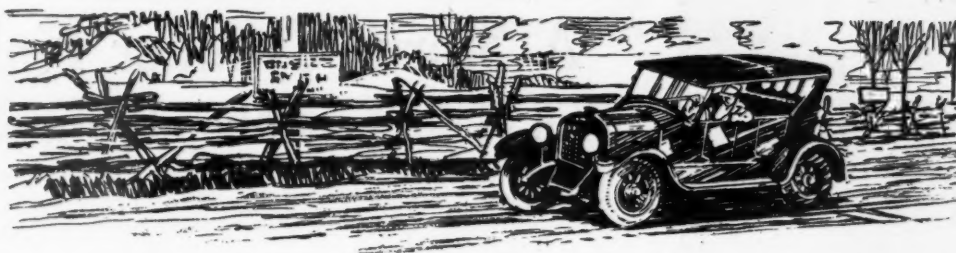


BANTAM BALL BEARING CO.,
Bantam, Conn.

Detroit Office:
905 Dime Bank Bldg.

F. M. Boyd, The Avon,
6 East Read St., Baltimore

Frank M. Cobbledick Co.,
1031 Polk St., San Francisco



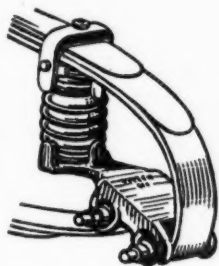
**\$22.50 complete including
guarantee**

A price that opens the way to big sales—backed by a guarantee broader than any heretofore offered the motorist.

Are You Getting Your Share?

FIGURE out how many owners of Dodge Brothers Cars in your neighborhood, and go to it. Broadcast the remarkable guarantee terms back of the Giant Shock Absorber—and keep doing it—it makes quick sales.

The best of springs break. A sudden, severe shock or extra heavy jolt—an unseen hole in the road—and the spring snaps. The terrific rebound does it.



REAR

When the rebound occurs—the severity of the strain is centered in the spring ends. The Giant coil spring—fitted between springs—"takes up" the rebound and prevents breakage.

The car owner is not only protected against spring breakage—but is provided with riding ease and comfort equivalent to that enjoyed by owners of high priced cars—expensively equipped.

Car owners using the Giant Shock Absorber are frank



Put a
Giant
to work
on Your
DODGE.

Giant Shock Absorbers

Built Especially for
DODGE BROTHERS CARS

to admit that it does more than we claim it does. Its cushioning effect is unusual. Its absorbing qualities remarkable.

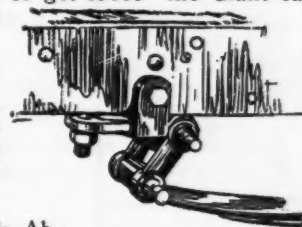
EASY TO INSTALL

Installation is extremely simple—does not mar the car in any way—all fittings are in unison with fittings of the car—nothing to rattle or get loose—the Giant can be bolted firmly to the springs in an hour.

LOW IN PRICE

\$22.50 complete, is a price that enables you to more than compete. It is a lower price for a high grade product.

Dealers:—The Giant Shock Absorber has selling features—and a price—that puts you in a position to make real profits quickly. If your jobber is out of stock—write us direct at once, and cash in on this live proposition.



FRONT

The front spring action is absorbed through the Shackle Spring Construction of the Giant—all stress and strain being eliminated.

RED GIANT TOOL CORPORATION
Lynchburg, Va.

We will be interested in hearing from good specialty representatives



A Storm Cylinder Finishing Tool Will Make Your Shop Profits Bigger This Year

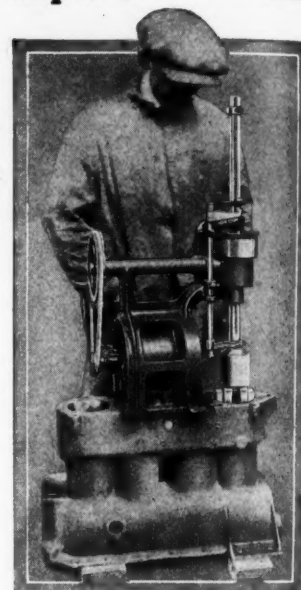
Without adding any extra help or expense an investment of as little as \$36.25 in a Storm Cylinder Finishing Tool enables you now to turn out the most profitable shop work in the shortest time—give a cylinder finish never before approached—do it in less time, do it better, and make more money on every job.

Storm Cylinder Finishing Head—\$36.25 Complete

Capacity 2 3/4 to 8 inch Cylinders

A tool you will use every day. For Electric Drill or Drill Press. Finishes worn and scored cylinders (up to .005") without previous machining operations, also polishes after boring, grinding, reaming, etc. Gives a working polish—a gun-barrel finish—heretofore found only on costly foreign built engines. Makes possible closest piston fitting.

Absolutely self centering at all times. No parts, blades or hones to change. Capacity 2 3/4 to 8 in. with unvarying correct pressure on all bores and at all speeds.



Storm Cylinder Finishing Machine

Will Repay Its Cost in 30 Days
in Saving of Mechanics' Time

A perfected, labor saving, machine method of driving the Storm Cylinder Finishing Head. Portable and power driven. No clamping to block and no aligning necessary. Positively self-centering. Automatic reverse feed adjustable up to 20 inch travel. The r.p.m. of the head and the speed of the feed are always under positive, correct control the same as on highest priced grinding machines.

Send For Our New Book on Modern Cylinder Methods. It describes the full line of celebrated Storm Tools, Stormizing Machines, Storm Garage Equipment. Free on request.

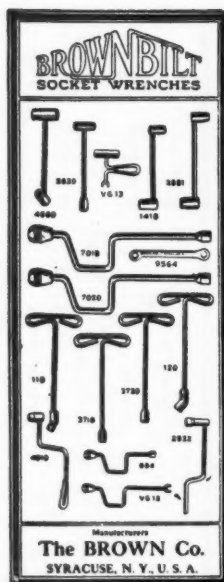
Put a Storm Cylinder Finishing Tool at Work in Your Shop. It will be the best investment you ever made, the fastest money maker you ever employed. Made and guaranteed by America's oldest cylinder equipment manufacturers. Order from your jobber today and start now to make better profits on cylinder work.

STORM MFG CO

Dept. A. 406 Sixth Ave. So.

Minneapolis

The Line That Pays



BROWN BILT Wrenches are backed by fourteen years of manufacturing experience. A wrench for every purpose. We illustrate this week our No. 300 Board (with eighteen sizes and types of wrenches). A silent salesman that brings results. One of these Boards in your show room is an ornament and a business getter. Your jobber can supply you. Ask by name—"BROWN-BILT." Catalogue on request.

THE BROWN CO.

100 Bellevue Ave., Syracuse, N. Y.

Representatives:

D. W. Van Keuren Co., 130 W. 42nd St., New York City
Schoen Bros., Boston Bldg., Louisville, Ky.
M. B. Berkman, 406 Carleton Bldg., St. Louis, Mo.
Sanborn & Putnam, 20 Stuart St., San Francisco, Cal.

CLASS JOURNAL PUBLICATIONS AUTOMOTIVE INDUSTRIES

The Engineering and Industrial Authority of the Automotive Field—Motor Cars, Trucks, Tractors, Airplanes. Read by Engineers, Production Managers, and other Executives of Automotive Manufacturing Companies.

MOTOR AGE

A Dealers' Journal, devoted principally to Service and the Maintenance of Automotive Apparatus and Equipment. In conjunction with Motor World, covers nearly 90% of the principal Dealer field.

MOTOR WORLD

A Dealers' Journal, devoted principally to the Distribution or Merchandising of Automotive Products and Equipment. In conjunction with Motor Age, covers nearly 90% of the principal Dealer field.

MOTOR BOAT

The oldest motor boat publication in the world. Read by Boat Owners, boat builders and supply dealers.

MOTOR TRANSPORT

The Oldest Truck publication in the United States. Read by Fleet Owners, their Traffic and Garage Managers. The logical medium for an advertiser who wishes to reach the real, important truck users.

EL AUTOMOVIL AMERICANO

The only automotive export paper going exclusively to Dealers and other members of the Automotive Trade in Latin America.

DISTRIBUTION & WAREHOUSING

Reaches 75% of the purchasing power wielded by the Transfer & Storage Industry. Transportation Companies, Pool Car Distributors, Public Merchandise Warehouses. A wealthy and active field needing Trucks, Labor Saving Devices, Warehouse Equipment, etc.

THE TIRE RATE BOOK

A quarterly publication containing special current information for Tire Dealers—price lists, types, sizes, etc. In constant use by practically all principal tire distributors.

THE CLASS JOURNAL COMPANY

CHICAGO
Philadelphia

Cleveland

NEW YORK
Detroit

Kawneer

SOLID COPPER
STORE FRONTS



Kawneer Fronts Fill Every Display Need

Thousands of Kawneer Fronts are now increasing sales for motor car and accessory dealers in all parts of the country. Kawneer resilient grip glass setting permits the safe use of large plates that are needed to display automobiles properly. These large windows show the product up to the greatest possible advantage, and every dealer knows what an irresistible attraction a well displayed car has for the prospective buyer.

Attach the coupon below to your letter-head and mail at once for free book of designs showing Kawneer Fronts that are selling motor cars every day.

THE
Kawneer
COMPANY

1319 Front Street

Niles, Michigan

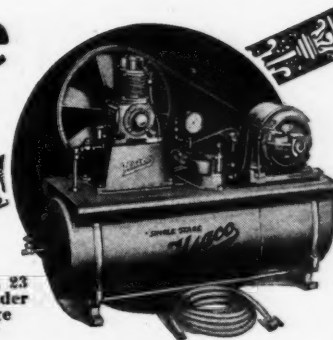
Gentlemen:—Please send me a copy of your free Book of Designs.

Name

Address

Service

has been the vital factor in establishing *Usaco* prestige



S. B. 23
Twin Cylinder
Single Stage
Compressor

An air compressor, to fully serve its purpose, must be instant in response, adequate to meet maximum requirements and absolutely dependable in operation.

To design a compressor that will maintain such service for a short time is an easy matter—to produce one that will do so day after day, for years to come, is a very different proposition.

In the face of keen competition, Usaco air compressors have maintained unapproached leadership; the name Usaco has become established as a word for quality in every city and hamlet in the country, and many of the most discriminating companies of national and international prominence have adopted these compressors as standard equipment.

Underlying this success has been the exceptional "Service" rendered—the inevitable result of inbuilt quality in every detail, highest standards of workmanship, fully automatic operation and specialized effort to build the world's best air compressor.

And Usaco quality will be yours whether you want a simple unit or a compressor of large capacity, two-stage or single-stage design, air or water cooled. The new Usaco "Perfect Balance" Service Tower is also a "knock-out"—made in every respect, up to the high Usaco standard of quality.



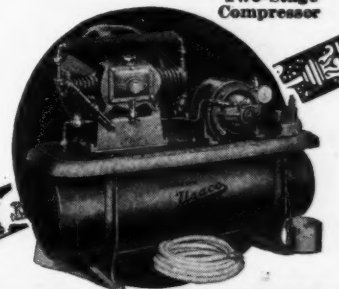
Usaco
Perfect
Balance
Service
Tower

Get the literature
and all the facts.

The United States
Air Compressor Co.

5304 Harvard Ave.,
Cleveland, O.

Usaco
Standard De Luxe
Two-Stage
Compressor



Two Stage *Usaco* Single Stage
AIR COMPRESSORS



**PRICE
\$1.40**

Sells on Sight!

A DUSTER that saves time for every car owner. Made of tan cotton, chemically treated. A Japanned handle that can't loosen.

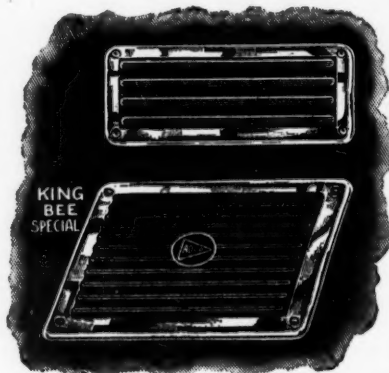
Pointed spoke brush for cleaning wheels (wood, wire or disc). Price \$1.10.

Auto washer spray brush for washing cars. Price \$3.70. All brushes guaranteed. Liberal discounts quoted on request.

The Superior Brush Co., Inc.
147 Temple Street,
Hartford, Conn.



The Most Handsome Combination Step and Kick Plate



Pressed heavy aluminum sheet pierced for special rubber mat insert, polished with beautiful mirror finish. Kick plate same construction.

Rubber mat insert, on these plates, of non-blooming live rubber extending above the frame forming a drain, thus preventing accumulation of water and slush.

Packed in attractive cartons.

Two handsome counter display boards packed with each dozen combinations.

**\$2.50
Complete**

Write for catalog describing complete line of auto accessories.

AMERICAN AUTOMATIC DEVICES CO.
500 S. Throop St., Chicago, Ill.

**SEMI-STEEL
CASTINGS**

*One of Seven Superior
Parker Features*

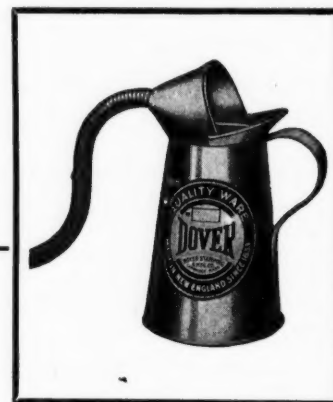
Parker Superior Vises are cast in our own foundries, a special mixture of Bessemer Steel and Grey Iron. Eighty-one years of progressive manufacturing experience have proved the superiority of this metal over all others for vise castings.



*Send for Parker
Feature Folder
No. 9.*

**The
Charles Parker
Company**
Master Vise Makers
Meriden, Conn.,
U. S. A.

**PARKER
VISES** Grip
Like a
Grizzly

You reach any oil-hole and any tank on any car with this Flexible Spout

This universal measure—complying with the law of all States—has many improvements.

The flexible spout is 8 inches long— $\frac{5}{8}$ inch in diameter—and is detachable.

The measure, itself, has a right angle positive filling edge, with lip around the top and a definitely indicated point up to where the measure should be filled.

These features prevent waste—spilling of oil—and afford user great convenience. Three sizes: 1, 2 and 4 quarts. Order your stock at once—cash in on this seller. A real live utility.

Dover Stamping & Mfg. Co.

385 Putnam Avenue
Cambridge, 39, Mass., U. S. A.



It's Your Car—Not A Car

What could make your Ford Car more Distinctive, Comfortable or Attractive than a set of Campbell Seat Covers which can be laundered?

They quickly save their cost in many ways—lengthen the life and wear of the upholstery, keep the dresses and cloaks of the lady occupants clean and spotless, and, above all, make your car different from the rest. They are easily applied and fit perfectly.

Write for swatches and prices.

The Perkins-Campbell Co.

622 Broadway, Cincinnati, Ohio

New York

Chicago

That most leading jobbers and dealers sell GLOBE Traffic Signals, Tool and Battery Boxes must indicate that they are salable and serviceable.

The Globe Machine & Stamping Co.

Cleveland, Ohio

World's Largest Producers of Traffic Signals, Tool and Battery Boxes.



No Need to Remove Engine

With this piece of equipment it is now possible to fit new oversized pistons without removing the engine from the car when the variations do not exceed five one-thousandths of an inch. Cylinders slightly tapered, out of round or with shoulders worn by pistons or rings, are made round, straight and true.

Red Devil

**Self-Aligning
Burnishing Machine**

Use after re boring to remove tool marks and to polish the cylinder walls—also after re grinding to remove wheel marks and burnish off high spots left in the cylinders.

Equipped with a Red Devil universal joint and designed for operation with a one-half inch portable electric drill. Suspension spring is furnished to relieve operator of back strain.

Two sizes—No. 1 fits all cylinder bores, 2 13/16 to 3 1/4 —No. 2 fits all cylinder bores, 3 1/4 to 4 1/8.

Price only \$25.00

Carried by leading jobbers

Mid-West Mfg. Company
Minneapolis, Minn.

**Red-Devil
Compound**



Scientifically developed and guaranteed to contain no abrasives such as emery, carborundum or ground glass or other substance that will injure cylinder walls by leaving a harmful deposit in the pores of the metal.

"WHITNEY"

LONG SERVICE CHAINS HIGH MILEAGE
SILENT TYPE

Never Skip the Sprocket Teeth



Unrivalled for Great Mileage

THE WHITNEY MFG. CO.
HARTFORD, CONN.

New York Boston Philadelphia
L. C. Biglow & Co., Inc. George C. Steil, R. J. Howison
232 West 55th Street 200 Devonshire Street. 1361 Ridge Ave.
San Francisco, A. H. Coates Co., 770 Mission St.

Appropriate for the finest car!

The Higgin is a staunch, durable, finely made visor that is wholly suitable for the finest car—and yet its price is low enough to be within reach of all car owners.

The Higgin is made of 22 gauge cold rolled steel—hard enamel finished, black on outside—green inside, and has a turned up gutter at the bottom to draw water to side.

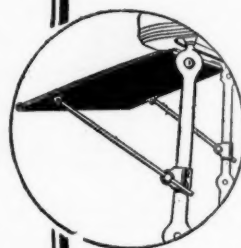
It's made for all cars including Fords—Its market is unlimited.

Write for Higgin's "protected territory" plan which includes 100% sales assistance.

The Higgin Manufacturing Co.
Automotive Division
Newport, Kentucky

HIGGIN ALL-METAL VISOR

Goes big
at
\$3.50



Installed in twenty minutes—it is easy and quick of adjustment and once adjusted stays put without rattling

There Is A BIG Difference

The accuracy and precision of repair work on pistons, wrist pins, bushings and connecting rods depends upon your aligning fixture. If you use an Eagle Aligning Device you know that you have the best fixture obtainable. It insures satisfactory work in your shop—and it assures a *pleased customer* who will boost for you.

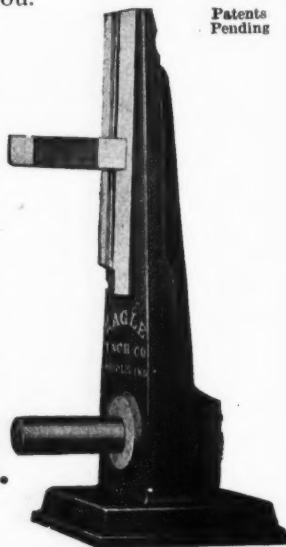
THE EAGLE ALIGNING DEVICE

Universal-Special

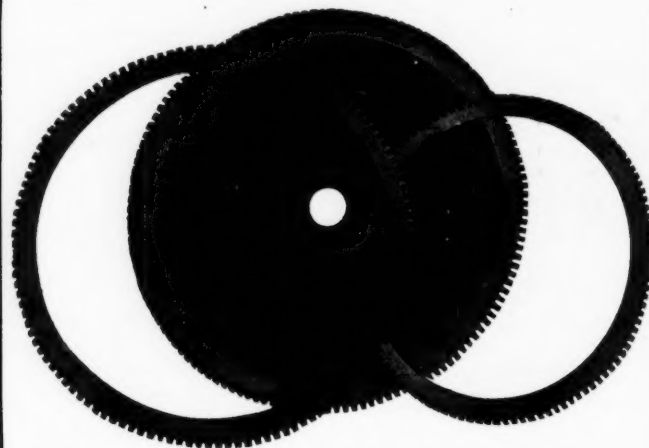
is unusually practical. Its bushings are of special patented design. The arbor is heat treated and the casting is hand-scraped to micrometer accuracy. The square is ground to perfect accuracy, square with base, and adjustable to any length rod. From the standpoint of efficiency—as well as economy—it will pay you to ask your Jobber about the Eagle. Or write us direct for information.

Eagle Machine Co.

24 N. Noble St.
Indianapolis, Ind.



Patents
Pending



Get Meachem Prices on Fly Wheel Rings

Quantity production of highest quality fly wheel ring gears enables us to quote surprisingly low prices. Write for price list. Ten thousand in stock for immediate delivery.

THE MEACHEM GEAR CORP'N
Syracuse, N. Y.



Make Your Service COMPLETE!

The more complete your equipment the more chances for bigger and better profits. "The Well Equipped Shop Gets the Business" is no idle remark. Day after day it is being proved.

You can now compete with the large regrinder on cylinder resizing jobs. There is a set made specially for this work on the most popular cars in your vicinity.

COLONIAL Cylinder Hones

for
Fords, Chevrolets, Dodges

These machines do the work cheaper, cost less and pay better profits because the time-cost is less than it is with the expensive machines now being used. They will do absolutely true and accurate work and yield a good profit on their investment.

Used by Manufacturers, endorsed by Engineers

Honing, rather than grinding lapping or boring is becoming the preferred method of finishing and resizing cylinders. Engineers endorse it, and several manufacturers make a talking point of the fact that their cylinders are honed.

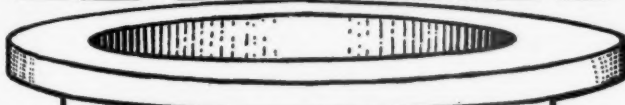
This set takes all holes from $3\frac{3}{4}$ to $4\frac{1}{4}$ inch bore. It comes complete with an Ames dial cylinder gauge that checks the work before and after honing. It is guaranteed against defects for a year. An inexperienced mechanic can learn to operate it in half an hour. The profits will be as big as you care to make them.

Can you afford not to have one?

Write for completely descriptive folder.

Colonial Gear & Manufacturing Co.
Kalamazoo, Michigan

JOHNSON BUSHINGS



ORDER FROM STOCK

Whether your requirements call for a bushing $\frac{1}{4}$ " in diameter and length or 12" in diameter and length—whether your immediate need is for 100 bushings or 100,000 bushings—regardless of type, size or quantity, we can generally handle your order from our huge stocks of finished bushings.

Write today for stock list and prices.

JOHNSON BRONZE CO.
New Castle, Pa.

At No Extra Charge

.015 Oversize



PISTON PINS

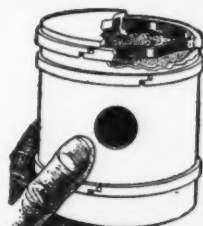
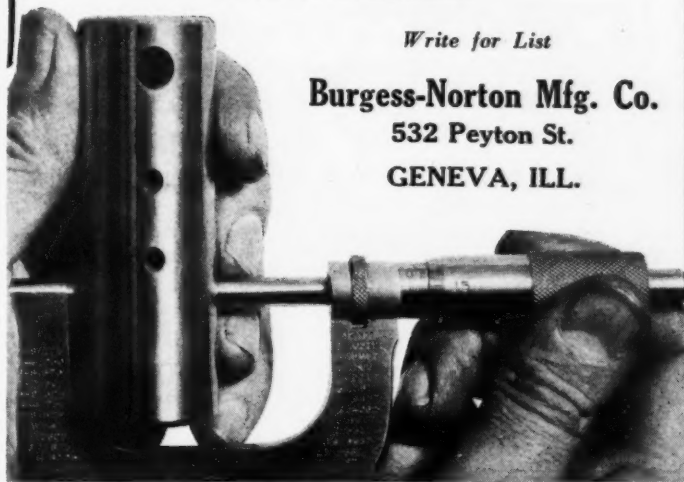
Same Price as Standard

24-Hour Service

Jobbers Everywhere

Write for List

Burgess-Norton Mfg. Co.
532 Peyton St.
GENEVA, ILL.



New
**SILENCE, POWER
ECONOMY and LONG
LIFE for MOTORS**

GENUINE

APEX INNERINGS

(INSIDE PISTON RINGS)

installed, one under each piston ring do the trick. No matter what the job, pleasure car, truck, tractor, light plant, marine or stationary engine—results are guaranteed when installed according to instructions. It is unnecessary to rebore; Innerings centralize pistons and cause perfect ring face alignment. Millions are in use—hundreds of thousands of car owners, dealers and garage men all enthusiastically endorse them. Talk to your dealer today. Order like piston rings. Retail Price, 30c ea. up $\frac{5}{8}$ " wide or 5" diam. Larger 50c.

DEALERS: Order now from your jobber—he stocks Genuine Apex Innerings or will quickly get them.

JOBBER: Write today for list of present connections and profitable information.

THOMSON-FRIEDLOB MFG. CO.

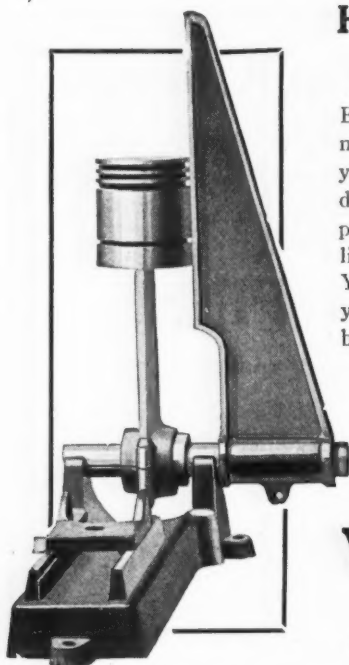
Peoria

Dept. C

Illinois



Insist that your purchase bears our guarantee Tag. It is your protection against fraudulent imitations.



Have You Taken Out Profit Insurance?

Efficient, accurate shop equipment is the best profit insurance you can get. When a job is done right and then checked by precision instruments there is little chance for a "come-back." Your profits will remain with you and not be eaten up later by make-goods.

Use this piece of Waller equipment for checking piston and rod assemblies. It will save its price many times over in a short time.

WALLER CONNECTING ROD AND PISTON ALIGNER

Detects the slightest bends or twists in connecting rods, pistons worn out of round or bored crooked or any misalignment in the piston and rod assembly. Operates within limits of .001 in. \$16.00 complete with Ford size arbor. Bushings for other size crankshafts, \$1.00 each.

Your jobber will supply you. Jobbers—Write for full information.

\$16
Complete

WALLER MFG. CO., DUBUQUE, IOWA.

(Formerly at Oelwein, Iowa)

The Clacker & Hixson Co., Sales Representatives
New York, 47 Murray St. Chicago, 52 E. 11th St.

\$ CIRCLE "S" AUTOMATIC WINDSHIELD CLEANER

The Price Is
\$5.00

**I'LL
TAKE ONE**

That is what every car owner will say when you explain the "CIRCLE S." There is no hesitancy in buying when you tell him how simply it operates without the aid of pistons, rods or vanes—How it utilizes every ounce of power because there is no internal friction—That all adjustments are made from inside the car, including the pressure of the squeegee against the glass which may be varied or entirely released—That the squeegee can be locked up out of the way when not in use—That this wonderful automatic windshield cleaner only costs \$5.00, little more than is asked for a good hand cleaner. There is quick sales and real profits for you in selling the "Circle S."

Dealers and Jobbers—Write us today
for sales proposition

F. W. STEWART MFG. CORP.

349 W. Austin Ave.,

Chicago, Illinois

Manufacturers of the well known Circle "S" Swivel Joints.

Cylinders Resized in Few Minutes

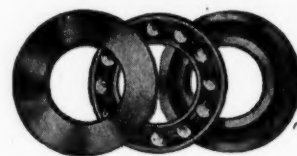
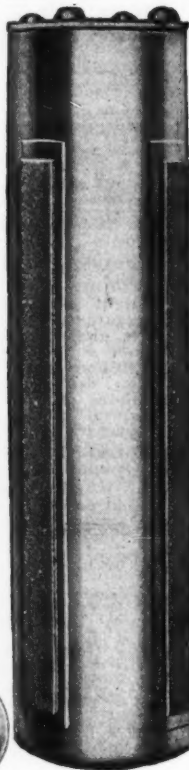
The Auto-Hone has created the biggest stir in the history of shop tools.

A cylinder resized and polished true, smooth and free from all traces of taper, ring travel and unevenness in fifteen to twenty minutes without taking down the engine or removing block from chassis.

Just remove cylinder head and pistons—attach driving handle of Auto-Hone to your shop drill—insert in open cylinder—turn on the power—and the honing stones grind down the usual five to seven thousandths out or round or taper in a few minutes.

Garages and Service Stations are making big profits. Put aside questions and curiosity and get a Hone. Write today.

No skilled help is required to resize cylinders with the Auto-Hone—it is so simple and effective.



STAR BALL RETAINERS for Thrust, Mag-neto and Cup and Cone Types of Bearings—

The Bearings Company of America
Lancaster, Penna.

Western Sales Office,
1012 Ford Bldg., Detroit, Mich.



FOLLETT'S NEW MODEL TIME STAMP

—accounts for every labor minute

Prints the year, month, day, hour, minute, A. M. or P. M. at the exact moment the plunger is pressed—like this, for example:

NOV 19 1920 4 31 PM


Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

Absolutely automatic—except for winding. Special machines, with as many as six different words, can be made. Every machine guaranteed.



Learn the interesting details from our descriptive data.

Follett Time Recording Co., 7 West Broadway, New York City



DE LUXE
Products

The pump that
does not
disappoint

Only \$3.50 Retail

ORDER DIRECT
SPECIFYING
JOBBER

The
DeLuxe
TIRE PUMP

Also
ARVIN HEATERS
DE LUXE,
DE LUXE VENTILATORS

INDIANAPOLIS PUMP & TUBE CO.
INDIANAPOLIS

The Ultimate Way WET INTERNAL GRINDING

Wet grinding, as made possible by the Micro Internal Grinder is as far in advance of ordinary dry grinding as the present day automobile is over the old ox team.

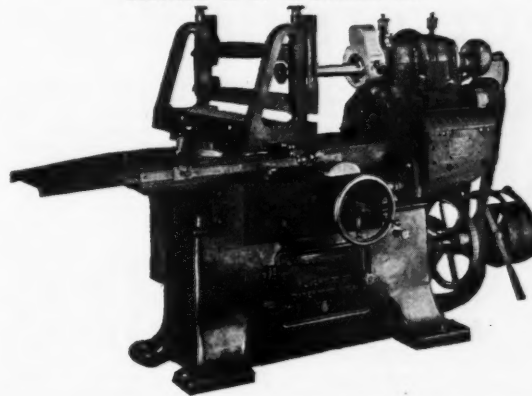
Micro

The Micro is a highly developed type of internal grinder adaptable for either wet or dry grinding, at the option of the operator, permitting highest quality of results. Its automatic action, both as to cut, feed and table travel provides the most accurate work humanly possible in exceptionally quick time.

If you're going to get a grinder, get the kind that will pay you biggest returns. Our bulletin gives full information—send for it.

MICRO MACHINE COMPANY, Bettendorf, Iowa

Successor to B. L. Schmidt Co.



The Hydraulic Control More Than a Shock Absorber

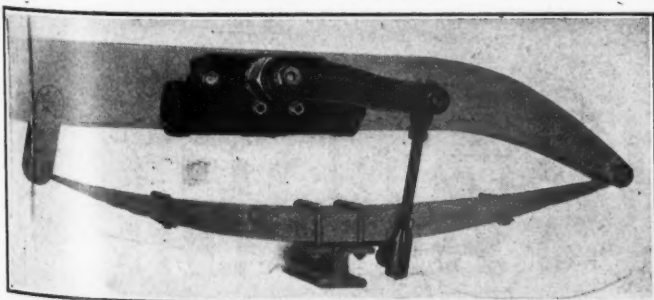
The Hydraulic Control consists of a double-headed piston playing back and forth within a double-headed cylinder, against oil which is permitted to escape through by-passes and regulating valves so that the movement of the piston and the body of the car is retarded by the fluid contents of the cylinder.

Easy to install — long life (all parts work in a bath of oil)—wonderful performance backed by records of achievement in service—make the Hydraulic Control an exceptionally fine proposition for the Distributor and Dealer.

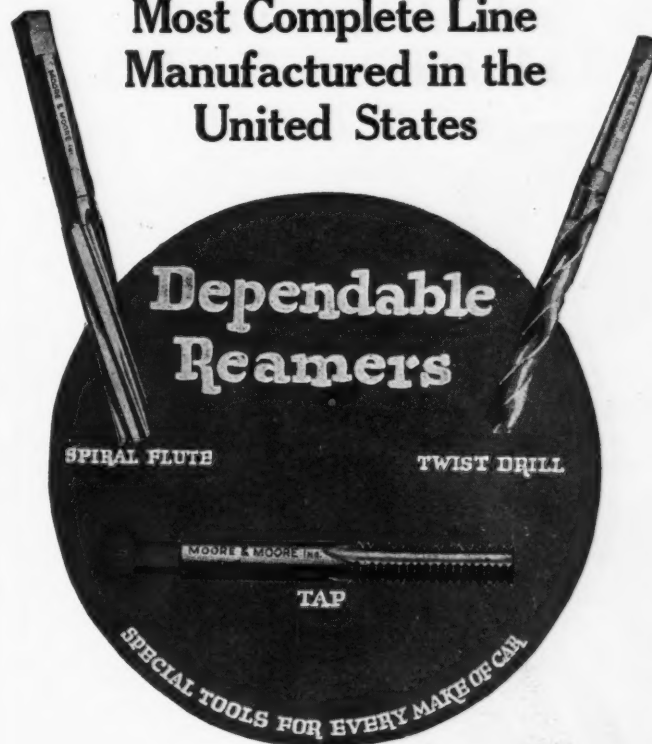
The Hydraulic Control FLUID-Cushions the Shock.

Write for details.

AUTO SPRING CONTROL COMPANY, INC.,
Jamestown, New York



Most Complete Line Manufactured in the United States



Moore & Moore, Inc.

Reading, Pa.

The Garage Special



Electric Drill and Valve Grinder

That saves every garage or repair shop time and money.

Louisville Electric Mfg. Co.

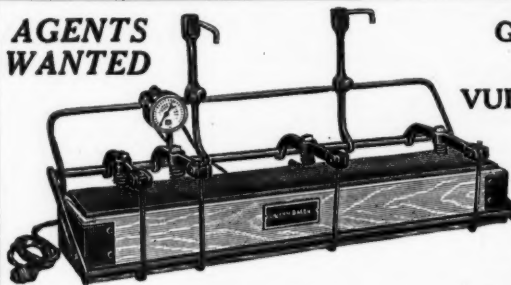
Incorporated

Louisville, Ky., U. S. A.

C. E. Willey, Pres. J. B. McFerran, Secy-Treas.

It will do the work.

AGENTS WANTED



GEE-BEE TUBE VULCANIZER

Steam Pressure, Electrically Heated, Automatic Control, Fire Proof, Efficient and Economical

Big profits for garages, repair shops and tire men with the Gee-Bee Tire and Tube Vulcanizer. Best and most reliable on the market. Few parts—nothing to get out of order. Patented automatic heat control. Cost less to operate than gas or gasoline. Made in all standard sizes. Low in price. Write for full particulars.

CHASE MFG. CO., 3220 Morgan St., St. Louis, Mo.
Successors to Gwynn-Bacon Vulcanizer Co.

Universal!



No. 2051—\$3.75

Because one or more Units of Basco Automotive Electrical Equipment or Body Hardware appear on the majority of American cars and trucks, the Basco Service Franchise is becoming steadily more profitable and more popular. A strong, responsible organization—a leader for 12 years—stands behind the Basco dealer.

BASCO PRODUCTS—Starting, lighting and Ignition Switches; Generator Cutouts; Horns; Body Hardware. Write for NEW catalog.



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Milwaukee, Wisconsin

11,000,000 Automobile Owners



DONNELLEY'S complete records of automobile registrations will provide you with accurate lists of all or any part of these owners separated according to territory or by make of car, whichever best meets your individual needs.

Our statistical department has available a vast fund of useful information pertaining to the automotive industry—also a national trade list of auto and accessory manufacturers and dealers. The free book "Automotive Markets and How to Reach Them," contains details. Write for your copy today.

The Reuben H. Donnelley Corporation

Mailing Service Department

334 E. 21st Street

Chicago, Illinois

NOISELESS TIMING GEARS

Formica is used



Install quietness—Cloyes Noiseless Timing Gears. They give the motor a soft, even "purr"—permanently.

Take advantage of our Direct-to-the-Dealer selling plan. It's interesting. So are the discounts.

CLOYES GEAR WORKS

1614 Collamer Ave.

Cleveland, Ohio

The SPRINGFIELD JACK No. 1

[Ball Bearing]



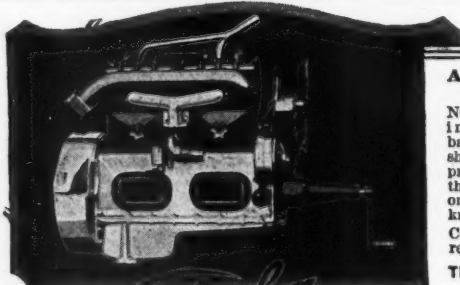
Height 9½"—Extends to 15½"
Capacity 1 Ton—Weight 6¾ lbs.
40" Telescope Extension Handle

Jack may be operated with Handle at half length, or fully extended to 40".

View Showing Handle Half Length 20"

Manufactured by

The Shawver Co., Springfield, Ohio



A New Bus and Truck Motor

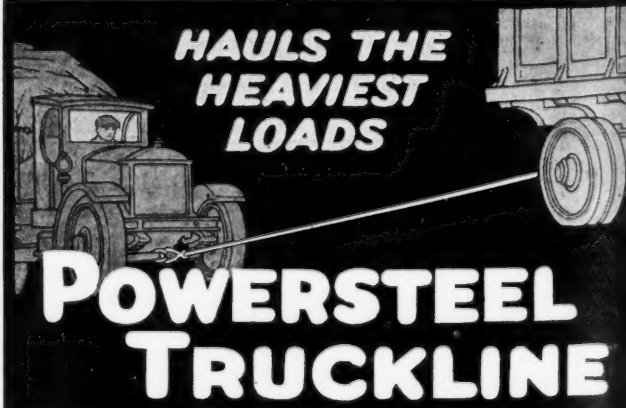
Numerous engineering refinements backed by Waukesha experience have produced a motor that develops economies heretofore unknown. Complete details on request.

The Waukesha Motor Company
Waukesha, Wisconsin

Waukesha
TRADE MARK

BUS and TRUCK MOTORS

HAULS THE HEAVIEST LOADS



POWERSTEEL TRUCKLINE

M-105

PARANITE CABLE

Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.



FOR 33 YEARS THE STANDARD
IF IT'S **PARANITE** IT'S RIGHT
Quality jobbers handle quality cable—that's **PARANITE**.

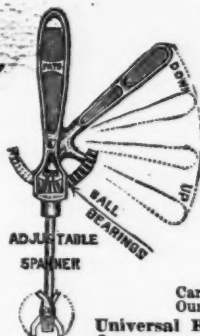
Indiana Rubber & Insulated Wire Co.
210 S. Desplaines St., Chicago
Factory and General Offices—Jonesboro, Ind.

Just use a natural, easy pump action to grind valves

SIMPLICITY VALVE GRINDER

Price

\$2.50



The simplest, sturdiest speed grinder made — so designed that you can do with it whatever the hardness, size and conditions of the valve requires.

With a natural, easy pump motion, the Simplicity Valve Grinder furnishes the repair man with a tool that turns out a finished job quickly and effectively. Its oscillating motion insures an even pressure on the valve at all times. Stroke never stops twice at the same place. There is no complicated series of gears, cams or pins to wear out.

Carried in stock by all jobbers. Our literature gives the details.

Universal Equipment & Supply Co.
Syracuse, N. Y.

E-C-L Pistons

ALUMINUM ALLOY NON EXPANDING



How to Eliminate Piston Slap

Piston Slap is a common and vexatious cause of engine trouble which in the past has bothered most car owners.

But it can now be eliminated.

With the E. C. L. Aluminum Alloy Non-Expanding Piston, E. C. L. Pistons may be fitted with a closer degree of clearance than cast iron pistons. They reduce the consumption of gas and oil — increase power and speed and eliminate spark knocks.

Let us tell you more about this remarkable piston. Write for the details today.

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Main Office and Factory

4834 Beaubien Street

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The Path to Profit Is One of Best Sellers Only



New Duo-Convex Bumper with back bar reinforcement. Double convex spring bars with graceful stream lines. Black or full nickel. \$15 to \$22, according to size and finish. Without back bar, \$12.



The New Duplex Sport Model. Most beautiful bumper on the market. Black japan or nickel. Medium cars, black, \$14.50, nickel \$16.50. Large cars, full nickel only, \$24.

A bumper that fits all cars, is made in 20 styles, guaranteed without reservation or time limit, and priced to beat all others of comparable quality, naturally is the best seller.

That Is the
New Era Line

Write for catalog and dealers' offer.

New Era Spring & Specialty Co.

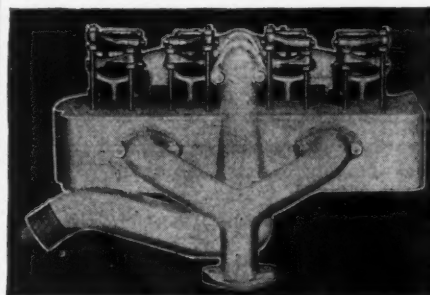
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Export Dept. 130 West 42nd St., New York City

New Departure Ball Bearings



ROOF 16 OVERHEAD VALVE EQUIPMENT For Ford and Dodge Motors ROOF 8 VALVE HEAD FOR FORD MOTOR



Stupendous Power—
Lightning Speed

Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete — ready for installation — no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality — lowest prices. A postal card brings you complete list of our specialties.

Jobbers—Dealers—Consumers—Write Us

THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

BLACK & DECKER QUARTER INCH DRILL



\$28.00

"With the Pistol Grip and Trigger Switch"

THE BLACK & DECKER MFG. CO.
Towson, Md.

THERE ARE PARTICULAR WALDEN-WORCESTER SOCKET WRENCHES FOR PARTICULAR PARTS OF EACH PARTICULAR CAR



For over sixty makes of cars and trucks in general use today, Walden-Worcester has Service Selections of Socket Wrenches — each selection especially adapted for particular parts of the particular car for which it is designed.

Your Jobber can supply you with any or all Selections from his stock. Write him.

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Incorporated

General Offices and Factory

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The Replacement Spring

JENKINS VULCAN SPRING CO.

Factory: RICHMOND, INDIANA

BRANCHES: Boston, Mass., 819 Boylston St.; Dallas, Tex., 2216-18 Commerce St.; St. Louis, Mo., Main and Cedar Sts.; San Francisco, Cal., 1035 Polk St.

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"Once an Owner, Always a Friend"

The complete Auburn line of 1923 including the Smaller Six provides a most attractive business opportunity for the dealer.

Auburn Automobile Company, Auburn, Indiana



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COMPLETE PISTON SERVICE

A ring for every purpose—Spiral Cut, Oilless and StepSet—and a complete line of semi-steel Replacement Pistons and high-grade Piston Pins. Write for details.

INLAND PRODUCTS CO., INC.

Main Office and Factory St. Louis, U. S. A.



Over the top on all four with a Rush Timer FOR FORDS

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Rush Brake Shoes—Transmission Band Oilier & Cooler



Kant-Skore

PISTONS

WEIGH LIGHTEST · FIT TIGHTEST

Regrinders, Repair Men, Dealers
Write for literature, price list and liberal proposition. Prompt service and delivery on all standard and special oversizes up to .065. Over 600 models.

THE KANT-SKORE PISTON CO., Cincinnati, Ohio, and Kansas City



Big Profits
for the
Dealer

The GLB Protector

Saves battery, lights, and generator. Guards charging line, cutout and ammeter. The details of this fast selling necessity will interest you. So will the prices.

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Be the local Logan Man — Let us show you how easy and how profitable it is to

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LOGAN FLY WHEEL RING GEARS

R & V Knight

SIX

"EVERLASTING PERFORMANCE"

Engine Sealed and Guaranteed for 2 Years

R & V MOTOR COMPANY

East Moline, Ill.

TAKE THE END-PLAY OUT!

—WITHOUT PULLING THE MOTOR



Pat'd 7-22-'22

THE C. A. ADJUSTABLE CENTER BEARING CAP corrects Ford crankshaft end-play and sets magnets for highest efficiency without removing the motor. Easily and quickly installed. Guaranteed for one year. List price \$3.75. Ask your jobber or dealer or write us direct.

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TESTING EQUIPMENT FOR ELECTRICAL SERVICE STATIONS

P. J. DURHAM CO.
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(1929)

Strom

BALL BEARINGS



All types and sizes of radial (single and double row), thrust and angular contact bearings. Write us for further information.

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Let your customers hear the Sparton speak!

Special display board given free with initial order for six. Write for complete particulars. The Sparks-Withington Co., Jackson, Michigan



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PISTONS

WEIGH LIGHTEST · FIT TIGHTEST

Regrinders, Repair Men, Dealers
Write for literature, price list and liberal proposition. Prompt service and delivery on all standard and special oversizes up to .065. Over 600 models.

THE KANT-SKORE PISTON CO., Cincinnati, Ohio, and Kansas City



Big Profits
for the
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The GLB Protector

Saves battery, lights, and generator. Guards charging line, cutout and ammeter. The details of this fast selling necessity will interest you. So will the prices.

Lupton, Hill & Lupton, Dayton, Ohio

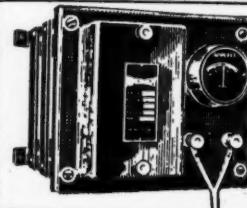


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Second Spare Tire Carrier And Rim Tool All-In-One

Attached or removed without tools, no installation cost, no time wasted, sale is complete over the counter. DOES A \$10 JOB FOR \$5. Locks both tires—Tires cannot chafe—Does not interfere with the use of tire covers—Improves the appearance of a car—Does a 100% job as a rim contractor and expander—Can be transferred from one car to another—Only one size to stock for all.

TRIPP-SECORD & CO.
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Automobile and Radio batteries charged for a nickel. Ten million car owners and five million radio fans are prospects for

THE HOMCHARGER

BIG PROFITS. WRITE NOW.

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MONOGRAM

The
Self Locking Radiator Cap




RELIO

The Van Norman
VALVO

Relio, an electric-drive wet grinder for pistons, pins, valves, bushings. \$475.00. Valvo, an electric-drive bench grinder for valves, valve-seat runners \$175. See page ads this paper.

Van Norman Machine Tool Co.
Springfield, Mass.



OWN A MONEY MAKING BUSINESS
Make \$1500 to \$3000 Yearly Charging Batteries


Get in this big money-making business NOW! Small cash payment BRINGS YOU AN HB CONSTANT POTENTIAL OUTFIT, TO GIVE 8-Hour BATTERY CHARGING SERVICE. Long easy terms on balance, more than carried by your increased profits. HB 8-hour charging service brings trade, beats competition. Long free trial on money-back guarantee. Write for information.

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BOSCH
American Bosch Magneto Corpn.
 Main Office and Works: Springfield, Mass.
 Branches:
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 Over 500 Service Stations in 500 Centers


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MOTOR DRIVEN CHAIN HOIST
LIGHT—PORTABLE—STRONG

Can be hooked up and plugged in anywhere. And where electric current is not available, the hand chain can be quickly applied—and the hoist operated as an ordinary chain block. Saves men, money and time. Learn the interesting details.

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See the Beveled Edge and Oil Groove of the Universal One-Piece Piston Ring

Forced Lubrication Prevents Foul Plugs. The beveled top edge and central groove keeps oil from the combustion chamber—reduces carbon. Dealers—Write for the details.

UNIVERSAL MACHINE COMPANY
 Baltimore, Maryland
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REID AIR SPRINGS
 FLOAT THE CAR ON AIR

Most highly developed but lowest priced Air Spring. No side sway or tipping at turns.

Can be installed by dealer who sells them. Big opportunity for distributors and dealers—sales are easy—discounts long. Write.

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 New Haven Conn.

WEIDENHOFF PRODUCTS
 Electrical Testing Equipment
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 Write today for Bulletin M-18.
 4358 W. Roosevelt Rd., Chicago, Ill., U.S.A.



INTERNATIONAL
MOTOR TRUCKS for low-cost hauling

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck. Some territory is still open for dealers.

International Harvester Company of America
 (Incorporated)
 Chicago, U. S. A.

KESTER *Lead-Core WIRE SOLDER*

REQUIRES ONLY HEAT



SAMPLE FREE

CHICAGO SOLDER CO., 1201 W. Hubbard Ave.


JOHNSON DIRECT JET BENCH FURNACES
REQUIRE NO FORCED AIR BLAST.
For Soldering and Heat Treating



The most economical, quickest heating Bench Furnace for any shop. No. 101

Fitted with two Powerful Johnson Burners, which produce a heat of 2000° F. in the fire-box instantly. Write for our descriptive circular of Gas Appliances.

JOHNSON GAS APPLIANCE CO.
 Cedar Rapids IOWA



Easier to Sell!

Motorists will buy the Hykon Luggage Carrier because it's the most practical carrier they have ever seen—and so inexpensive. Placed under the running board, Holds luggage secure. Durable and easy to use. List \$1.50. Ask your Jobber.

THE HYKON MFG. CO., Alliance, Ohio

Hykon LUGGAGE CARRIER

Seven body types—\$1395—\$2385

STEPHENS
Finer Motor Cars  *At Lower Prices*

ARE YOU LOOKING FOR A REAL BARGAIN?

Watch the classified advertising columns of MOTOR AGE and you'll see many of them. Often a man has goods for quick disposal and he announces the fact here. Whether or not you are in the market right now for certain things you will find it pays to look over the classified ads every time you receive your copy of the paper. It's a good habit to get into and some day you'll be mighty glad of it.

Get the Habit—
READ THE CLASSIFIED ADS IN MOTOR AGE

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"UNICO" QUICK-SEATING "UNIC-OIL"
 Plain Step Cut Oil-Control

PISTON RINGS

Ask for Samples and Prices

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Air Compressors; Gasoline and Oil Storage Systems; Heavy Metal Storage Tanks; Oil Burning Systems; Furnaces and Forges; Oil Filtration Systems; Water Softening Systems.

WAYNE TANK & PUMP COMPANY,
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Wayne

No. 452
Visible Gas Pump

The **100% ARCHER** *for*
HINGED BRAKE SHOE **FORDS**

Entire shoe surface grips the Drum. Four times the brake power and practically indestructible.

Manufactured by **SAMUEL B. ARCHER**
Electrical and Mechanical Engineer
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CABLES of Quality

The Packard Standard since the beginning of the industry.

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PERFECTION **Silent Timing GEARS**

PERFECTION GEAR COMPANY

1475 Michigan Ave. CHICAGO

SILENT DURABLE DEPENDABLE

WORLD'S STANDARD REPLACEMENT

DILL INSTANT-ONS

Dust and Valve Cap
Off or On in 5 Seconds

The Dill Manufacturing Co. **Cleveland, O.**


51.6/10 MILES ON A GALLON OF GAS

It is the official world's record-breaking test with Ford Touring car. The new 1922 Stromberg Carburetor and Hot Spot did it—made this marvelous mileage possible.

Tens of thousands of Ford owners are now obtaining more miles on a gallon—quicker getaway—easier starting—increased power and speed—all because of having their cars so equipped.

Live dealers are requested to write for facts pertaining to territory.

Stromberg Motor Devices Co.
64 E. Twenty-Fifth St. Dept. 27 Chicago, Ill.

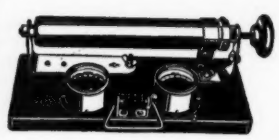


GUAY CLUTCH DISC & PLATE

For Dodge Bros. Cars

Models for other cars will be announced shortly. Extraordinary flexibility and durability are gained by passing every thread of asbestos over and under the steel fingers at a given length of $\frac{3}{4}$ inch. Thus all strings are under the same measured spring tension. Steel and asbestos only materials used. No wires or rivets to cause uneven wear. Price of complete set, \$12.00. Good discounts to trade. Write for complete details.


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TEST YOUR BATTERIES

by the Chart Method. Something New. Send for free booklet, today.

Allen-Bradley Co.
Electric Controlling Apparatus
281 Greenfield Ave., Milwaukee, Wis.



JOBBERS

Do not overlook these live selling and profitable items. The metal is brass, heavy nickel plated and will not rust.

Four styles—one for every car. No. 503 with the Hump Base. No. 504 with Ell Base. No. 505 Plain Lock-Type. No. 506 Swivel Lock-Type.

Packed fifty to carton; five display cards of ten each.

The company that took the rattle out of Anti-Rattlers

THE AUTOQUIP MFG. CO., Inc., 495 St. Paul St., Rochester, N. Y.

Send Us Your Armature Repair Work

FORD ARMATURES REWOUND \$2.00


MOST ANY TWO UNIT GENERATOR ARMATURE \$5.00

ALL WORK GUARANTEED—WRITE FOR PRICE LIST

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EARL THE VALUE of TODAY

MOTOR CAR **EARL MOTORS, INC.**
Jackson, Michigan



Monogram Light Distributors

Standard Equipment on 30 of America's Foremost Cars

Write for Prices.

MONOGRAM LENS CORP.,
1834 Broadway, New York

Empire **THE NEW EMPIRE DISTRIBUTION PLAN**

Tires and Tubes enables dealers to make extra profits on these well known super-standard casings and tubes.

"Wear Longest"

Empire Tire & Rubber Corp
TRENTON NEW JERSEY

Piston Pins **TRINDL** **and Valves**

Oversizes Standards Specials

Prompt shipment, highest grade materials, precision accuracy to closest dimensions and unexcelled workmanship. Send for specification and price lists—they make pin and valve buying simple.

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COMFORT PRINTING SPECIALTY CO.,
101 No. Eighth St., St. Louis

Please send us your free catalog of record cards and office forms for garage and auto dealers.

Name

Address

City State

The Bear Tractor

Write today regarding unassigned territory, and ask for catalog and distributor's and dealer's proposition.

Bear Tractors Inc., 5300 Park Place, New York City

The Tractor that Delivers its Power to the Drawbar

Inshield
SPOT & SERVICE
LIGHT COMBINED

INSIDE THE CAR

FITS ALL CARS
OPEN & CLOSED

The Light that
Means Most to
The Motorist

MADE IN TWO SIZES
ASK YOUR JOBBER

MFG. BY THAL & BITTER MCH. CO. TOLEDO, O.

E-Z SPRING

FOR FORD CARS

Makes riding and driving a pleasure. Eliminates road shocks and hard steering, spring breakage, shock absorbers. Write for our money making dealer proposition.

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204 Mound St.,

Columbus, Ohio

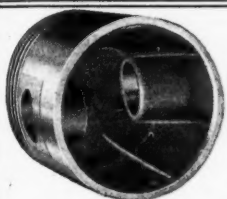
WICACO Twin Cut Piston Ring—

With the Wandering
Oil Groove

[pronounced
WICK-A-CO]

WICACO

SCREW & MACHINE WORKS, INC., 4801 Stenton Ave., Phila., Pa.



**LIGHT IN WEIGHT
MORE IN POWER**

FOSTER

Sensible lightweight pistons

FOSTER-JOHNSON REAMER CO.
1052 Beardsley Ave. ELKHART, IND.

**ZIP Grinding Compound
Friction Paste**

Guaranteed to do a "better valve grinding or bearing fitting job in half the time." Get some from your jobber—or write us.

THE ZIP MFG. CO., Denver
THE ZIP ABRASIVE CO., Cleveland



**JACOBS CHUCKS INSURE
ACCURATE DRILLING**

Write for circular, "A Jacobs Chuck
for Every Purpose."

THE JACOBS MANUFACTURING CO.
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SELL OIL FROM THE CURB

The Correct Measure Motor Oil Display Pump will increase your oil business. Handsome. Compels attention. Delivers 1/2 gallon in 12 seconds. Can be put on curb in morning—and back indoors at night. \$45 per unit. Write for details concerning this money maker.

CORRECT MEASURE
MOTOR OIL DISPLAY PUMP

Correct Measure Co., Inc.

Rochester, Pa.

Thirty-seven
BRANCHES
AHLBERG BEARING COMPANY
321 EAST TWENTY-NINTH STREET, CHICAGO ILLINOIS



**UNIVERSAL HOSE
CLAMP**

Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

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ATWATER KENT

The World's Highest Grade
Ignition, Starting & Lighting.

4957 STENTON AVENUE

PHILADELPHIA, PA.

**TIMER
BINGO**

DEALERS

FIRES EVERY TIME

Write for proposition in detail

Bingo Timers, coming to you at manufacturers cost on your initial order will make you 100% profit on cost.

THE WM. DEDDENS MFG. CO., 35 East Front St., Cincinnati, O.

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Taps, Dies, Cutters, Drills, Reamers
Send for Catalog

ALVORD REAMER & TOOL COMPANY
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**LINENDOLL EXHAUST
HEATER**

Warms any car, open or closed.
No odor, smoke, dust or noise.
Easily installed, operated and cleaned.
Sells quickly. Write for our attractive trade proposition.

THE NORWALK AUTO PARTS COMPANY
Norwalk, Ohio



The **COURIER** Six

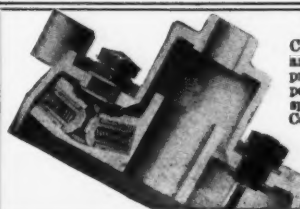
Nine body types,
from \$1,195 to \$2,165

THE COURIER MOTORS COMPANY
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Gill-Special-Servus

Piston Rings for Every Need

GILL MFG. CO., 8300 South Chicago Ave., Chicago



THE DOUBLE CONTACT TIMER
Combines the "wipe" and "roll" contact principles. Gives full, perfectly synchronized spark at all speeds. Contacts are positive and unfailing. A wonderful dealer proposition. Write E. D. Hodge Tool & Mfg. Co., Watertown, N. Y.

Twin Timer
FOR FORD CARS TRUCKS & TRACTORS

Disks fit all plugs—25 times more spark gap. Price 4 for \$1.00

Return them and get your money if they foul, or do not improve the power, ignition and starting. Our Thermostatic carburetors atomize, gasify and mix the proper amount of fuel with ALL the air taken into the motor. More miles per gallon, and less motor heat guaranteed. Liberal proposition to dealers.



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DIAMOND Automatic Automobile SAFETY SIGNAL

Dealers Wanted—Send for Folder

AUTOMOTIVE DISTRIBUTING CORPORATION
703 Finance Building Philadelphia



Let us send you our FREE Catalogue on

Huetter's Fly-Wheel Gear Bands

Huetter Machine & Tool Co.
545 Kentucky Ave. Indianapolis, Ind.

Welco Products Are Quick Sellers

All-Size Step Plate fits all running boards by simply moving toe plate forward. Welco Ford Accelerator works independently of hand throttle; very easy installation. Welco Blanket Holder keeps blanket securely on radiator against strongest wind. Write for trade proposition.

WELKER MANUFACTURING CO., Middletown, Conn.

WELCO Products

HETE-PRUF

TRADE MARK

The Piston Ring Guaranteed against warping or loss of tension through heat.

Write for details

Manufactured by
Leeseberg Machine & Mfg. Co.
Fostoria, Ohio

Sales Representatives
Pressure Proof Piston Ring Co.
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K-D Parallel Jaw
Valve Spring Lifters

Does Your Jobber
Carry K-D Specialties?

K-D MANUFACTURING CO.,



K-D No. 100
Cut-Out Pedal

Dealers Write NOW
Sending Jobber's Name

Lancaster, Penna.

MR. DEALER

For quick, sure sales and big fat commissions, you can't beat the Dunn Products.

Counterbalances for Ford, Dodge, New Overland 4, and Chevrolet 490—Front and Rear Fender Braces for Fords—Motor Supports for Ford and Chevrolet 490—Hot Spot Manifold Heaters—Handy Luggage Carriers. All sure sellers—big profits to the dealers.

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Dunn Sales Co., 250 W. 54th St., New York



**"In Stock—
Not Over a Day Away"**

Write Milwaukee Die Casting Co., Milwaukee, Wis., for name of distributor nearest you.

MILWAUKEE BEARINGS

CANEDY-OTTO MFG. CO.

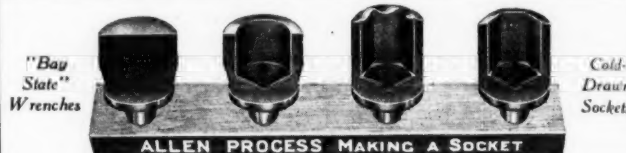
Manufacturers of Automotive Equipment, Drills, Punches, Shears, Shrinkers, Countershafts, Grinders, Buffers, Forges, Blowers, Tufere Irons and Blast Gates.
Main Office and Factory—Chicago Heights, Ill.
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SPARK PLUG

With the Explosive Spark
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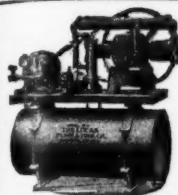
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FRENCH
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ANY CAR

ANY MODEL

ANY YEAR



DAYTON AIR COMPRESSORS

Automatic Control. Automatic Release.
Start against no load.
Style E-2: 2 3/4 cu. ft. per minute.
140 lb. pressure. Tank 16x36, 32 gallon.
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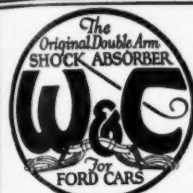
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SIGNALS RIGHT, LEFT, GO OR STOP

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VALVE-SEAT REAMER
Pilot may be expanded to fit the valve-stem hole regardless of wear.
Cuts valve seat CONCENTRIC with hole. No chatter-marks. Full set in oak case \$12.00. Circular.
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(Replacing Old Style Cut-out)
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Small Size \$3

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PISTON PINS
Automotive Division
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400 motors of all kinds in stock.
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FORD GEN. ARMATURE, \$2.50
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SPECIAL LIGHT WEIGHT CAST IRON PISTONS

PISTONS—RINGS—WRIST PINS SCORED CYLINDERS REPAIRED

REBUILT AND NEW ELECTRIC MOTORS, GENERATORS and transformers, all standard makes, sold, bought and exchanged. Our rebuilt motors stand every test of new motors; 8000 always in stock; send for stock list. Write what you want or have to sell.

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Bosch

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"The Name"
ROBERT BOSCH
and This
TRADE MARK



The New
Robert Bosch
Electric Horn



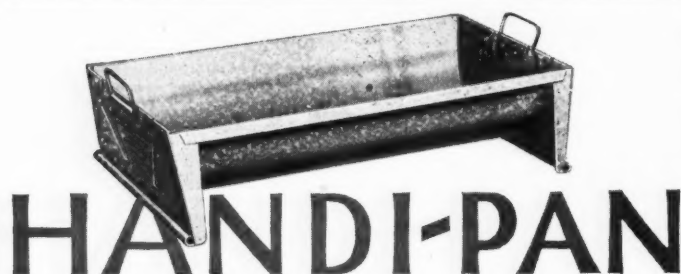
Spring Sales and Profits!

Increase both this outfitting season by concentrating on these live automotive accessories—the undisputed leaders in their field—

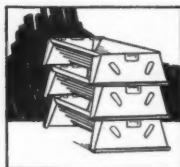
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Magnetos—Spark Plugs
Horns and Spot Lights

Genuine, Original Bosch Products. Attractive territory open—get posted at once.

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OTTO HEINS, President
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The Genuine, Original Bosch means Robert Bosch only.



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SAVES SPACE

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Send your jobber a check for a sample. He'll refund it if you don't like Handi-Pan. Price \$2.50. West of Rockies, \$3.00.

Sales Dept.

Standard Motor Parts Co.
1464 S. Michigan Ave., Chicago, Ill.

Made by
ROBERTSON BROS. MFG. CO.
5401 S. Western Blvd., Chicago, Ill.



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Child or Stepchild? An Analogy

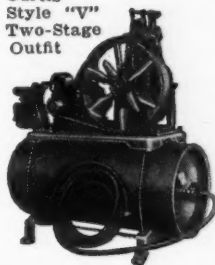
Maximum pressure—tank storage capacity—motor characteristics—automatic starting duty—frequency of operation—these are but a few of the problems peculiar to air compressors for free air service in garages and filling stations. It is to the purchaser's own greatest interest and protection to see that his CURTIS compressor outfit is a genuine CURTIS factory built product, factory guaranteed, supplied and sponsored by a designing, engineering and manufacturing institution with a career of 69 successful years.

When you purchase a CURTIS garage compressor outfit, built complete by the CURTIS organization in the CURTIS plant, your protection lies in the following facts:—

- 1—The proper relation and suitability of component parts. No misfit motors, switches and the like. Speeds, loads and capacities are right, starting loads are eliminated and there is a consequent freedom from trouble and expense which the chances favor in an amateur assembled outfit—a "stepchild" at best.
- 2—A complete unit tested as a unit under its own power in addition to the usual separate test of component parts; a final check-up under your actual running conditions duplicated in our shop.
- 3—The CURTIS guarantee covers the entire unit as a whole and the CURTIS organization stands back of it as a unit; no divided responsibility, no shifting of the blame for possible trouble later on,—“no passing of the buck.”

A Two-Stage Compressor Is Only as Good as its Intercooler

Curtis
Style "V"
Two-Stage
Outfit

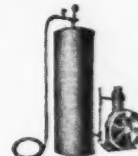


- (a) COPPER Intercoolers with thin radiating fins rigidly attached are original with CURTIS two-stage compressors. One hundred and thirty-five per cent better heat-conducting properties than cast iron, 112% better than steel and 27% better than aluminum.
- (b) CURTIS Intercoolers are approximately 50% longer and have about 100% more heat-radiating fins than competing designs.
- (c) CURTIS Intercoolers are exposed their entire length to the cool blast of the fan flywheel.

All the features of the CURTIS Single-Stage, plus real two-stage efficiency



Style "X"
Single-Stage
Outfit
Portable,
Belted or
Geared. Five
sizes, A.C.
or D.C. Motor.



Style "S"
Single-Stage
Outfit Belted
only. Five
sizes, 1/4 to 3
H.P.

We manufacture a complete line of both single and two-stage air compressors. A style, size and arrangement to meet your particular need. Write at once for full details and prices.

CURTIS PNEUMATIC MACHINERY CO.

1527 Kienlen Avenue

St. Louis, Mo., U. S. A.

Branch Office 530-H Hudson Terminal, New York City.

Canadian Representative: Joseph St. Mars, Winnipeg and Toronto, Canada

Curtis Pneumatic Machinery Co.

1527 Kienlen Ave., St. Louis, Mo.

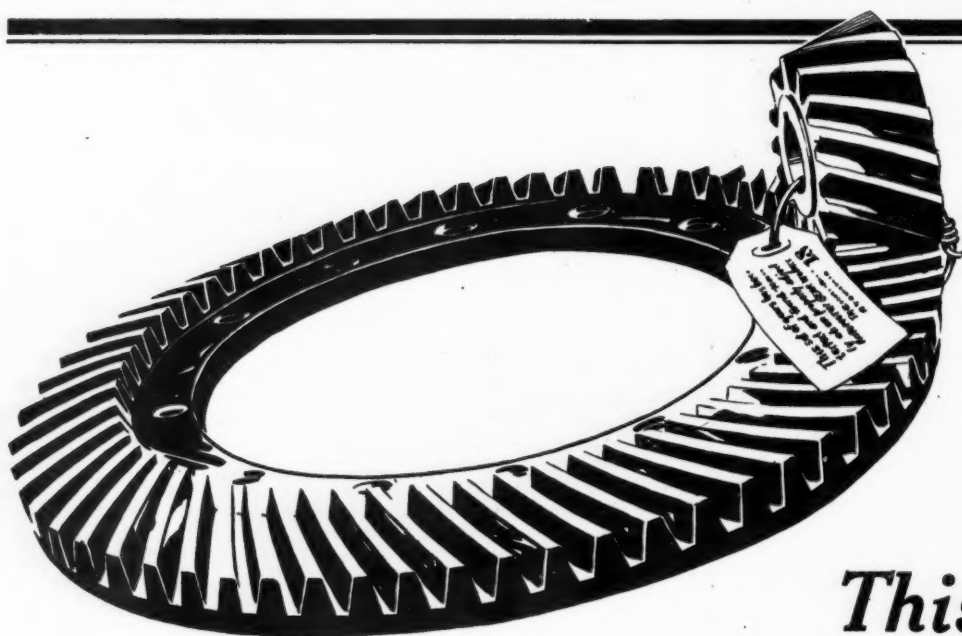
Gentlemen:—Please send me descriptive folder and full particulars on Curtis Air Compressors.

Name

Address

Jobber's Name

Address



Address Automotive Gear Co.
at These Addresses:

ATLANTA
174 Spring St.
BOSTON
1151 Commonwealth Ave.
CHICAGO
1424 S. Michigan Ave.
CLEVELAND
6305 Euclid Ave.
LOS ANGELES
1213 S. Hope St.
PHILADELPHIA
1404 W. Girard Ave.
SEATTLE
520 E. Pike St.
RICHMOND, INDIANA
Factory

This Method Assures Quiet Operation

Double Diamond differential ring gears and pinions are matched on a machine specially designed for the purpose. A ring gear and a pinion will not always match, even though each of them will pass every other test for gear quality. The only way to play safe is to actually match them AND THEN KEEP THEM IN SETS.

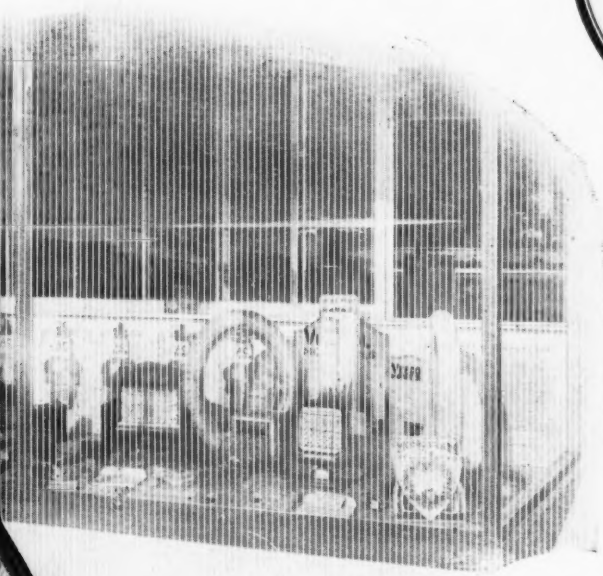
When you order a Double Diamond ring gear and pinion you receive an absolute guarantee that they will operate together quietly.

This is just one feature of Double Diamond "Nationalized Gear Service" which indicates why thousands of dealers and service stations are enthusiastic users of Double Diamond differential and transmission gears.

Our nearest jobber or branch will ship your order the same day it is received.

AUTOMOTIVE GEAR WORKS, Inc.
Factory and General Offices: Richmond, Indiana

Double Diamond Gears



"Speaks for itself"

Demonstrate The Williams Accelerator for FORD CARS

with this new, attractive, six-color window and counter display stand.

It tells the whole sales story, quickly—convincingly—Shows the Ford Owner why the WILLIAMS ACCELERATOR is the best foot throttle that money can buy—enables him to see at a glance the simplicity of the connections—how easily it is installed—how well it is made—wins his confidence because it leaves nothing to the imagination.

A display that interests, convinces, sells—one that reflects the high quality of the article it advertises and at the same time dignifies your counter or your window.

This display includes a specially finished, nickel-plated WILLIAMS ACCELERATOR mounted on the stand for demonstrating purposes.

Check over your stock of WILLIAMS ACCELERATORS; be sure you have enough on hand to meet an increased demand, then order this beautiful display stand from your Jobber.

WILLIAMS BROS. AIRCRAFT CORP.
1211 VAN NESS AVENUE - SAN FRANCISCO - CALIFORNIA



"Carry this kit and save a fine"

THIS is one argument that accessory dealers the country over are using successfully to sell Edison MAZDA Auto Lamps by the kit—*six lamps instead of one.*

"We feel that we are doing the customer a favor, and maybe helping him to avoid a fine, by asking him to buy a kit of lamps," writes the Scherneck-Miller Company, automotive equipment dealers, at 852 North Broad Street, Philadelphia.

"We have not only sold considerably

more lamps through the means of the kit but we have actually had passersby come in for kits after seeing them displayed in our windows."

The kit is small, stoutly built and holds securely six spare lamps—one for each socket. It will make money for you; for you can sell six lamps where you are now selling one, without extra effort. Ask your jobber to tell you how to tie up with the 1923 advertising campaign of Edison MAZDA Auto Lamp Kit in leading magazines.



EDISON MAZDA LAMPS



A GENERAL ELECTRIC PRODUCT